Deal School Curriculum

Mathematics
Curriculum Guide
Grade 4

Deal School

Deal, New Jersey

2024
Board of Education

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Developed and Written

August – November 2014

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December 2018
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Board Approved

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Course Introduction

The *Big Ideas* program fully aligns with the New Jersey State Learning 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 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 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.

Climate Change Example: Students may, knowing that energy and fuels are derived from natural resources and that their uses affect the climate, use the four operations to solve multi-step word problems posed with whole numbers, having whole-number answers and that are based on energy, fuels, and natural resources.

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.	1. How can change be described mathematically?

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.	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….**
● 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 in this way.

Assessment 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

Diversity, Equity & Inclusion, LGBTQ
cultural patterns and shapes lesson

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

9.1- Personal Financial Literacy

9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.
9.1.5. EG.4: Describe how an individual's financial decisions affect society and contribute to the overall economy.
9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2 Career Awareness, Exploration, Preparation, and Training

9.2.5.CAP.2: Identify how you might like to earn an income.
9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.

9.3 Career & Technical Education

9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

9.4 Life Literacies and Key Skills

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).

9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

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.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

Computer Science and Design Thinking

8.1 Computer Science
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

8.2 Design Thinking
8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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

With accuracy and efficiency, 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.	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?

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.	
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
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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.
● 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 <.
	● 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.
	● 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.

Assessment/Evaluation Evidence

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- 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

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.

- Use technology to enhance productivity increase collaboration and communicate effectively.

9.1- Personal Financial Literacy
9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.
9.1.5. EG.4: Describe how an individual's financial decisions affect society and contribute to the overall economy.
9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
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9.2 Career Awareness, Exploration, Preparation, and Training
9.2.5.CAP.2: Identify how you might like to earn an income.
9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.

9.3 Career & Technical Education
9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

9.4 Life Literacies and Key Skills
9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
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9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.
9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

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
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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

Computer Science and Design Thinking

8.1 Computer Science
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

8.2 Design Thinking
8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Pacing Guide

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Deal School Curriculum
Grade 4 Mathematics – Measurement

Desired Outcomes

Solve problems involving measurement and conversion of measurements and conversion of measurement from a larger unit to a smaller unit.

NJSLS.MATH.CONTENT.4.M.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.M.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.

Climate Change Example: Students may, knowing that energy and fuels are derived from natural resources and that their uses affect the climate, use the four operations to solve word problems related to the use of natural resources and involving distance, time, liquid volume, and/or the mass of objects.

NJSLS.MATH.CONTENT.4.M.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.

Geometric measurement: understand concepts of angle and measure angles.

NJSLS.MATH.CONTENT.4.M.B.4

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.M.B.4.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.M.B.4.B

An angle that turns through n one-degree angles is said to have an angle measure of

n degrees.
NJSLS.MATH.CONTENT.4.M.B.5
Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
NJSLS.MATH.CONTENT.4.M.B.6
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 circular arc between 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. ● Apply the area and perimeter

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. ●	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.

Assessment/Evaluation Evidence

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Big Ideas Apply and Grow

Summative Assessments
Unit Assessments
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Project specific Rubrics
Group Project Products

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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
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    - Direct instruction and modeling.
    - Partner practice and discovery.
- Think and Grow
    - Guided practice
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- Apply and Grow - Independent Practice
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Graphic organizers
Math Tool Paper
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Smart Notebook

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
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9.1- Personal Financial Literacy

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9.2.5.CAP.2: Identify how you might like to earn an income.
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9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

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9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
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9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.
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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

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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

Computer Science and Design Thinking

8.1 Computer Science
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

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8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Pacing Guide

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Deal School Curriculum
Grade 4 Mathematics – Data Literacy

Desired Outcomes

Organize data and understand data visualizations

NJSLS.MATH.CONTENT.4.DL.A.1
Create data-based questions, generate ideas based on the questions, and then refine the questions.

NJSLS.MATH.CONTENT.4.DL.A.2
Develop strategies to collect various types of data and organize data digitally.

NJSLS.MATH.CONTENT.4.DL.A.3
Understand that subsets of data can be selected and analyzed for a particular purpose.

NJSLS.MATH.CONTENT.4.DL.A.4
Analyze visualizations of a single data set, share explanations, and draw conclusions that the data supports.

Represent and interpret measurement data.

NJSLS.MATH.CONTENT.4.DL.B.5
Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). 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. Climate Change Example: Students may, knowing that energy and fuels are derived from natural resources and that their uses affect the climate, make a line plot to display a data set of measurements in fractions of a unit.

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.	● 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

• 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.	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. • 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.

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Exit Slips
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Group Reporters
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Math Journals

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Flashcards
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Multi-language glossary
Graphic organizers
Math Tool Paper
Dry Erase Boards
Smart Notebook

Diversity, Equity & Inclusion LGBTQ
height comparison line plots- comparing the diverse heights of students (with whole numbers)

Career Readiness, Life Literacies, and Key Skills Practice

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height comparison line plots

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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**
. 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	● 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,

a specified size. ● 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.	or the presence or absence of 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.

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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

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Suggested Learning Plan

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

- Warm Up/ Dig In
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    - Direct instruction and modeling.
    - Partner practice and discovery.
- Think and Grow
    - Guided practice
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- 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.

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Big Ideas Math Modeling Real Life - Teacher Resources

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

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Enrichment and Extension
Prerequisite Skills Practice
Pre and Post Course Assessments

Course Benchmark Assessments
Chapter Assessments
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Math Musicals
Virtual Manipulatives
Interactive Explorations
Digit Examples
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Multi-language glossary
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Math Tool Paper
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Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

9.1- Personal Financial Literacy

9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.
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9.2.5.CAP.2: Identify how you might like to earn an income.
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Accommodations and Modifications

Gifted and Talented
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- 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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Projects
Place Value Project
Million Dollar Project
Movie Theater Design Project
Animal Measurement Project

Computer Science and Design Thinking

8.1 Computer Science
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

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Pacing Guide

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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-Digit 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 Shapes

Working document.

Update as needed.

Annual Pacing Guide

Grade Level: 4th

Subject: Math

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 5

Deal School

Deal, New Jersey

2024
Board of Education

Kay Jannarone, President
Michael Sorrentino, Vice President

Giovanni Astorino
Joseph Nachmani
Joseph Rishty

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Teacher(s)

Christina Robbins
Tiffany Resto
Ryan McMichael

Developed and Written

August – November 2014

Revised

December 2018
January - May 2024

Board Approved

August 2024

Course Introduction

The *Big Ideas* program fully aligns with the New Jersey State Learning 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 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 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.	● Use parentheses, brackets, or braces in numerical expressions. ● Evaluate expressions with these

● Parentheses, brackets, or braces are used in numerical expressions. ● Numerical rules govern the formations of numerical patterns. ● Ordered pairs may be graphed on a coordinate plane.	symbols. ● 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.

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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., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

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

With accuracy and efficiency, 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	● 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.

subtraction ● It is possible to add, subtract, multiply, and divide decimals to hundredths.	● Fluently multiply multi-digit whole 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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Diversity, Equity & Inclusion, LGBTQ
Global Market Math Challenge- perform operations with decimals

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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 (i.e., 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? Climate Change Example: To examine the impact climate change has on agriculture, students may solve word problems about the reduced yields of staple crops and their distribution that involve division of whole numbers and lead to answers in the form of fractions.

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 × a)/(n × 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) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 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 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (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? Climate Change Example: To examine the impact climate change has on agriculture, students may solve real-world problems about the reduced yields of staple crops and their distribution that involve division of unit fractions by non-zero whole numbers and/or division of whole numbers by unit fractions.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of 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.	3. How do mathematical models/representations shape our understanding of mathematics?
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 ($a/b = a \div b$). ● Fractions and whole numbers may be multiplied by a fraction. ● The product $(a/b) \times q$ is interpreted as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. ● 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	● 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 ($a/b = a \div b$). ● 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 $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. o Find the area of a rectangle

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 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.	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 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 ÷ (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

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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

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

9.1- Personal Financial Literacy

9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

9.1.5. EG.4: Describe how an individual's financial decisions affect society and contribute to the overall economy.
9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2 Career Awareness, Exploration, Preparation, and Training
9.2.5.CAP.2: Identify how you might like to earn an income.
9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.

9.3 Career & Technical Education
9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

9.4 Life Literacies and Key Skills
9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.
9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

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

Computer Science and Design Thinking
8.1 Computer Science 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. **8.2 Design Thinking** 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models. 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
Pacing Guide
https://docs.google.com/document/d/1vd6CkkTw0nLBivO15QJUhk3HW6-6YWJLbTuw2UDaEQ8/edit?usp=sharing

Deal School Curriculum
Grade 5 Mathematics – Measurement

Desired Outcomes

Convert like measurement units within a given measurement system.
NJSLS.MATH.CONTENT.5.M.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.
Geometric measurement: understand concepts of volume.
NJSLS.MATH.CONTENT.5.M.B.2
Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
NJSLS.MATH.CONTENT.5.M.B.2.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.M.B.2.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..M.B.3
Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
NJSLS.MATH.CONTENT.5..M.B.4
Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
NJSLS.MATH.CONTENT.5.M.B.4.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.M.B.4.B
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.
NJSLS.MATH.CONTENT.5.M.B.4.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	1. How are measurement and counting related?

different but may be related to one another in ways that permit calculation of one given the other.	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 involving volume. ● Volume is additive. ● The volume of a right rectangular prism with whole-number side lengths is found by packing it with unit	● 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 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

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Assessment/Evaluation Evidence

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Dry erase board assessment
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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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    - 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

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

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9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

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9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2 Career Awareness, Exploration, Preparation, and Training

9.2.5.CAP.2: Identify how you might like to earn an income.

9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.

9.3 Career & Technical Education

9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

9.4 Life Literacies and Key Skills

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).

9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

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

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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.

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Couponing project
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Road Trip Project
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Coordinate Plane Map Project
Volume City Project

Computer Science and Design Thinking

8.1 Computer Science

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

8.2 Design Thinking

8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Pacing Guide

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

Deal School Curriculum
Grade 5 Mathematics – Data Literacy

Desired Outcomes

Understand and analyze data visualizations

NJSLS.MATH.CONTENT.5.DL.A.1

Understand how different visualizations can highlight different aspects of data. Ask questions and interpret data visualizations to describe and analyze patterns.

NJSLS.MATH.CONTENT.5.DL.A.2

Develop strategies to collect, organize and represent data of various types and from various sources. Communicate results digitally through a data visual (e.g. chart, storyboard, video presentation).

NJSLS.MATH.CONTENT.5.DL.A.3

Collect and clean data to be analyzable (e.g., make sure each entry is formatted correctly, deal with missing or incomplete data).

NJSLS.MATH.CONTENT.5.DL.A.4

Using appropriate visualizations (i.e. double line plot, double bar graph), analyze data across samples.

Represent and interpret data.

NJSLS.MATH.CONTENT.5.DL.B.5

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.

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	● 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).

fractions of a unit (1/2, 1/4, 1/8). ● Operations on fractions are used to solve problems involving information presented in line plots.	● Use operations on fractions for this grade to solve problems involving information presented in line plots. .

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    - 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

Diversity, Equity & Inclusion LGBTQ
height comparison line plots- comparing the diverse heights of students (with fractions)

Career Readiness, Life Literacies, and Key Skills Practice

Career Ready Practices

- Act as a responsible and contributing community members and employee.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

9.1- Personal Financial Literacy

9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.
9.1.5. EG.4: Describe how an individual's financial decisions affect society and contribute to the overall economy.
9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2 Career Awareness, Exploration, Preparation, and Training
9.2.5.CAP.2: Identify how you might like to earn an income.
9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.

9.3 Career & Technical Education
9.3.HT-RFB.4 Demonstrate leadership qualities and collaboration with others.

9.4 Life Literacies and Key Skills
9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.
9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

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
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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

Computer Science and Design Thinking

8.1 Computer Science

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

8.2 Design Thinking

8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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. Climate Change Example: Students may represent real world problems about the reduced yields of staple crops by graphing points in the first quadrant of the coordinate plane; Students may interpret coordinate values of points in the agricultural context.

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	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?

permit calculation of one given the other	
Learners will know…	**Learners will be able to….**
● A pair of perpendicular number lines, called axes, to define a 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.	● 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. ● 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	
<u>Formative Assessments</u> 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
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LinkIt! Benchmark A
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Alternative Assessments
Project Specific Rubrics
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Suggested Learning Plan

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

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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 Numbers

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

2024
Board of Education

Kay Jannarone, President
Michael Sorrentino, Vice President

Giovanni Astorino
Joseph Nachmani
Joseph Rishty

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Teacher(s)

Christina Robbins
Tiffany Resto
Ryan McMichael

Developed and Written

August – November 2014

Revised

December 2018
January - May 2024

Board Approved

August 2024

Course Introduction

The *Big Ideas* program fully aligns with the New Jersey State Learning 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 – Ratios & Proportional Relationships

Desired Outcomes

NJSLS.MATH.CONTENT.6.RP.A.
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 ¾-cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." (Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)
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.

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.
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?
c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{3}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.
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. 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….**
● 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 multiplying or dividing quantities.

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Pre-Assessments
Thumbs Up
Exit Slips
Think Pair Share
Group Reporters
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Turn and Talks
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Summative Assessments
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LinkIt! Benchmark C

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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
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- Graphic organizers
- Math Tool Paper

- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities & Diversity, Equity and Inclusion
What does a Mathematician look like?

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
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- Pair visual prompts with verbal presentations
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Interdisciplinary Connections/Cross Curricular Opportunities

<u>Literacy Connection</u>

NJSLS.RI.CI.6.2 Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RL.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

NJSLS. L.VI.6.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

NJSLS.RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users

Pacing Guide

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

Deal School Curriculum
Grade 6 Mathematics – The Number System

Desired Outcomes

NJSLS.MATH.CONTENT.6.NS.A
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 $\left(\frac{2}{3}\right)\div\left(\frac{3}{4}\right)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $\left(\frac{2}{3}\right)\div\left(\frac{3}{4}\right)=\frac{8}{9}$ because $\frac{3}{4}$ of $\frac{8}{9}$ is $\frac{2}{3}$. (In general, $\left(\frac{a}{b}\right)\div\left(\frac{c}{d}\right)=\frac{ad}{bc}$). How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb. of chocolate equally? How many $\frac{3}{4}$ cup servings are in $\frac{2}{3}$ of a cup of yogurt? How wide is a rectangular strip of land with length $\frac{3}{4}$ mi and area $\frac{1}{2}$ square mi?

NJSLS.MATH.CONTENT.6.NS.B
Compute fluently with multi-digit numbers & find common factors & multiples.
NJSLS.MATH.CONTENT.6.NS.B.2
With accuracy and efficiency**,** divide multi-digit numbers using the standard algorithm.
NJSLS.MATH.CONTENT.6.NS.B.3
With accuracy and efficiency**,** 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 $4(9+2)$.

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

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.
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.
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.

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.
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3°C > -7°C$ to express the fact that $-3°C$ is warmer than $-7°C$.
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.
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	● 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

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.	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.

	○ Write, interpret, and explain statements of order for rational numbers in real-world contexts. ○ 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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Thumbs Up
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Student Self-Assessment
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LGBTQ+ and Disabilities & Diversity, Equity and Inclusion
What does a Mathematician look like?

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

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9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

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9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
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9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).

9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).

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9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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.

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

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- Establish procedures for accommodations and modifications for assessments as per IEP/504
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- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLS.RI.CI.6.2 Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RL.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

NJSLS. L.VI.6.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

NJSLS.RI.MF.6.6. Integrate information when presented in different media or formats (e.g., visually, quantitatively) to develop a coherent understanding of a topic or issue.

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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users
Pacing Guide
https://docs.google.com/document/d/1QoRrCV4tu6hmA4huZ70JJzSTNubLpepTkjM0St_Emao/edit?usp=sharing

Deal School Curriculum
Grade 6 Mathematics – Expressions and Equations

Desired Outcomes

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

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

NJSLS.MATH.CONTENT.6.EE.B.
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. Climate Change Example: Students may solve real-world problems by writing and solving one-variable equations related to deforestation and/or increasing livestock farming as contributors to climate change.
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 diagrams.

NJSLS.MATH.CONTENT.6.EE.C.
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. Climate Change Example: Students may analyze and use variables to represent the relationship between greenhouse emissions and livestock farming when representing relationships among contributors to climate change.

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….**
● Expressions that record operations are written with numbers and with letters standing for numbers. ● Mathematical terms are used to identify parts of an expression. ● 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.	● Write and evaluate numerical expressions involving whole-number exponents. ● Write, read, and evaluate expressions in which letters stand for numbers. 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

● 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 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.	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 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	
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Deal School Curriculum
Grade 6 Mathematics – Geometry

Desired Outcomes

NJSLS.MATH.CONTENT.6.G.A

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 $V = lwh$ and $V = Bh$ 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 (e.g., pyramid, triangular prism, rectangular prism) 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**
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….**

• 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	
<u>Formative Assessments</u>	

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

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- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities & Diversity, Equity and Inclusion

What does a Mathematician look like?

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
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9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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
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- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLS.RI.CI.6.2 Determine the central idea of an informational text and explain how it is supported by key details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RL.CR.6.1. Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

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-Interpret figures of speech (e.g., personification) in context.
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2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

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8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

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Deal School Curriculum
Grade 6 Mathematics – Statistics and Probability

Desired Outcomes

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

NJSLS.MATH.CONTENT.6.SP.B.
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. Climate Change Example: Students may display numerical data related to deforestation and increasing livestock farming as contributors to climate change 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:

a. Reporting the number of observations.
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
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.
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.

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10.2 Histogram

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2 Collaborating Around Computing and Design

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Pacing Guide

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

Annual Pacing Guide

Grade Level: 6

Subject: Math

September	October	November	December	January
Number System **Ch. 1 Big Ideas**	Number System **Ch. 2 Big Ideas - Fractions** **Ch. 2 Big Ideas - Decimals**	Ratios and Proportional Relationships **Ch. 3 Big Ideas**	Expressions and Equations **Ch. 5 Big Ideas**	Expressions and Equations **Ch. 6 Big Ideas**

February	March	April	May	June
Number System **Ch. 4 Big Ideas**	Number System **Ch. 8 Big Ideas**	Statistics and Probability **Ch. 9 Big Ideas**	Statistics and Probability **Ch. 10 Big Ideas**	Geometry **Ch. 7 Big Ideas**

Mathematics - 6

Inclusive Lessons, What does a Mathematician Look Like?

Scheduled to be taught on 02/14

Created by Quackenbush, Tiffany

21st Century Themes
*Global Awareness
21st Century Skills
*Creativity and Innovation
Goals and Objectives
STANDARD: N.J.S.A. 18A:35-4.35-36 Students will be able to see that mathematicians are diverse and see themselves as a mathematician.
Learning Activities or Instructional Strategies
Warm Up: Students will draw what they believe a mathematician looks like. Discussion: Show photos of diverse people in the stem profession including mathematicians. Ask students to notice and wonder. Class discussion on what makes someone a mathematician, and what one looks like? Explain that everyone is a mathematician no matter their race, gender, or sexual orientation. Use photos to explain (description of each person). Utilizing this resource and others: https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6 Activity: Students will complete an activity where they either add a real picture or draw a photo of themselves, and adding a short bio, showing that a mathematician can look like you or me.
Differentiation
Teacher assistance as needed
Resources Provided
https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6
Assessments
What does a Mathematician Look Like Activity
Standards
No standards have been assigned to this lesson.
Lesson Documents
No documents have been uploaded to this lesson

Mathematics - 6

Inclusive Lessons, 10.2 Histograms

Scheduled to be taught on 02/14

Created by Quackenbush, Tiffany

21st Century Themes

*Global Awareness

21st Century Skills

*Critical Thinking and Problem Solving

Goals and Objectives

Display and interpret data in histograms.

Learning Activities or Instructional Strategies

Day 1:

Warm Up: Mental Math

Exploration (prior knowledge to relate to histograms)
A slow reveal graph is projected for students to see. They will notice and wonder what the graph is about. Slowly each slide will reveal something more about the graph. Class discussion will take about about what each reveal means and how important it is to the graph. Graph used is linked below

N.J.S.A. 18A:35-4.35-36
https://docs.google.com/presentation/d/1zxoj3itsoal8J8cAfDwMDXKjzRgTjRg2NEaUMceFOfU/edit#slide=id.p

Another graph will be displayed which is a histogram. Similar conversation about about what each reveal means. However, discussion about the different types of graph will occur (histogram vs. bar graph)

N.J.S.A. 18A:35-4.35-36
https://docs.google.com/presentation/d/1mavJjDQWPPhfZd6Wkzs0aY_fJ9LkUcN08tYJiKeaJxo/edit#slide=id.p

Edpuzzle
Students will take notes while watching edpuzzle on topic

Day 2:

Warm Up: Mental Math

Student Led Discussion
Students will discussion what they learned from the epduzzle. Questions at the end of the edpuzzle will be answered by the teacher.

Word Problems
The last example which is a word problem will be done in class, students will complete the last two try it problems with a partner.

Practice
Students will complete a practice activity to reinforce new skills.

Differentiation

Guided Notes - modification as needed
Teacher assistance as needed

Resources Provided

Guided Notes
Graphs (see links above)

Assessments

Edpuzzle
Practice Actitity

Standards

1. 4.10B Grade 6 CPI 1
Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

Lesson Documents

No documents have been uploaded to this lesson

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 7

Deal School

Deal, New Jersey

2024
Board of Education

Kay Jannarone, President
Michael Sorrentino, Vice President

Giovanni Astorino
Joseph Nachmani
Joseph Rishty

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Teacher(s)

Christina Robbins
Tiffany Resto
Ryan McMichael

Developed and Written

August – November 2014

Revised

December 2018
January - May 2024

Board Approved

August 2024

Course Introduction

The *Big Ideas* program fully aligns with the New Jersey State Learning 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 – Ratios & Proportional Relationships

Desired Outcomes

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

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

and inequalities so solutions can be found.	
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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- Cross-Curricular Projects
- Graphic organizers
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LGBTQ+ and Disabilities & Diversity, Equity and Inclusion

What does a Mathematician look like?

6.4 Percent Increase and Decrease

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

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9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
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9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
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English Language Learners

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

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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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

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8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

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Pacing Guide

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Deal School Curriculum
Grade 7 Mathematics – The Number System

Desired Outcomes

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

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.

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?
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.
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.
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.

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.
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.
c. Apply properties of operations as strategies to multiply and divide rational numbers.
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. (Clarification: Computations with rational numbers extend the

rules for manipulating fractions to complex fractions.) Climate Change Example: Students may solve real-world problems involving the four operations with rational numbers related to the relationship between altitude and the temperature above sea level.

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. ● Multiplication is extended from	● 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). Show that the distance

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.	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
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
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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:

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    - Partner practice and discovery.
- Examples and Try It
    - Guided practice
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- Chapter Assessments

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2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

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8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

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Deal School Curriculum
Grade 7 Mathematics – Expressions and Equations

Desired Outcomes

NJSLS.MATH.CONTENT.7.EE.A.
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."

NJSLS.MATH.CONTENT.7.EE.B.
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. Climate Change Example: Students may solve multi-step real-life problems posed with positive and negative rational numbers in any form related to the relationship between altitude and the temperature above sea level.
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.

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 with accuracy and efficiency. 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?
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

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Deal School Curriculum
Grade 7 Mathematics – Geometry

Desired Outcomes

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

NJSLS.MATH.CONTENT.7.G.B.
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. Climate Change Example: Students may solve real-world problems involving area, surface area, and volume related to deforestation and increasing livestock farming as key contributors to climate change.

Enduring Understandings	Essential Questions
1. Two- and three-dimensional objects can be described, classified, and analyzed by their attributes.	1. Why do we compare contrast and classify objects?

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	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….**
● 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	● 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.

involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms..	• 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.

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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.
- Examples and Try It
    - Guided practice
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- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

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- Mini-Assessments
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- Game Library
- Multi-language glossary
- Cross-Curricular Projects
- Graphic organizers
- Math Tool Paper
- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities & Diversity, Equity and Inclusion
What does a Mathematician look like?
Inclusive House Scale Drawing

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

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Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

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9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
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9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).

9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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>

NJSLS.RI.CI.7.2. Determine a central idea in an informational text and explain how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RI.CR.7.1. Cite several pieces of textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.

NJSLS.L.VI.7.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

SL.II.7.2. Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture
2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users

Pacing Guide

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

Deal School Curriculum
Grade 7 Mathematics – Statistics and Probability

Desired Outcomes

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

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

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

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.
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.

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.
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.
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 unlikely event, a probability	● 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.	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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Pacing Guide

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Annual Pacing Guide

Grade Level: 7

Subject: Math

September	October	November	December	January
Adding and Subtracting Rational Numbers (Number System) **Ch. 1 Big Ideas**	Multiplying and Dividing Rational Numbers (Number System) **Ch. 2 Big Ideas**	Expressions (Expressions and Equations) **Ch. 3 Big Ideas**	Equations and Inequalities (Expressions and Equations) **Ch. 4 Big Ideas**	Ratios and Proportions (Ratios and Proportional Relationships) **Ch. 5 Big Ideas**

February	March	April	May	June
Percent (Number System) **Ch. 6 Big Ideas**	Probability (Statistics and Probability) **Ch. 7 Big Ideas**	Statistics (Statistics and Probability) **Ch. 8 Big Ideas**	Geometry (Geometry) **Ch. 9 Big Ideas**	Surface Area and Volume (Geometry) **Ch. 10 Big Ideas**

Mathematics - 7

Inclusive Lessons, 6.4 Percent Increase and Decrease

Scheduled to be taught on 02/14 02/15

Created by Quackenbush, Tiffany

Goals and Objectives

Find percents of change in quantities.

Learning Activities or Instructional Strategies

DAY 1:

Warm Up: Mental Math

Exploration
Students will explore the percent change in the number of salmon after passing through one or more dams.

Discuss
Introduce and discuss percent of change, percent of increase, and percent of decrease.

Edpuzzle
Students will complete notes while watching edpuzzle on topic.

DAY 2:

Warm Up: Mental Math

Student Led Discussion
Students will recap what they learned from the edpuzzle. Questions that were asked at the end of the edpuzzle will be asked by the teacher.

Word Problems
Last example and try it problems (word problems) will be done in class and with a partner.

Practice
N.J.S.A. 18A:35-4.35-36
Problems involving the statistics about LGBTQ community will be utilized in word problems to find the percent of change from one year to another to bring awareness that more people are opening up and feeling more safe to do so.
https://www.nbcnews.com/nbc-out/out-news/percentage-lgbtq-adults-us-doubled-decade-gallup-finds-rcna16556#20220216-out-chart

Differentiation

Guided Notes
Teacher assistance when needed

Resources Provided

Guided Notes

Assessments

Edpuzzle
Practice activity

Standards

1. 4.7B Grade 7 CPI 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.

Lesson Documents

No documents have been uploaded to this lesson

Mathematics - 7

Chapter 5: Ratios and Proportions, Scale Drawing

Scheduled to be taught on 02/16

Created by Quackenbush, Tiffany

21st Century Themes
*Global Awareness
21st Century Skills
*Communication and Collaboration *Creativity and Innovation *Critical Thinking and Problem Solving *Life and Career Skills
Goals and Objectives
Students will be able to a scale drawing a of house, that is also wheelchair accessible.
Learning Activities or Instructional Strategies
Warm Up: Show a house that is wheelchair accessible vs one that is not. Students will notice and wonder. Project: Students will work in small groups to research the space needed for a wheelchair so they can create a scale drawing of a wheelchair accessible house. Students will be graded on scale drawing as well as practicability of house for disabled individuals. Students will also need to find the area of house, calculate flooring and paint cost.
Differentiation
Some students may be given the information needed to start project like size of wheelchair and space needed. Teacher assistance as needed.
Assessments
Project
Standards
1. 4.5H Grade 7 CPI 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.
Lesson Documents
No documents have been uploaded to this lesson

Mathematics - 7

Inclusive Lessons, What does a Mathematician Look Like?

Scheduled to be taught on 02/14

Created by Quackenbush, Tiffany

21st Century Themes
*Global Awareness
21st Century Skills
*Creativity and Innovation
Goals and Objectives
STANDARD: N.J.S.A. 18A:35-4.35-36 Students will be able to see that mathematicians are diverse and see themselves as a mathematician.
Learning Activities or Instructional Strategies
Warm Up: Students will draw what they believe a mathematician looks like. Discussion: Show photos of diverse people in the stem profession including mathematicians. Ask students to notice and wonder. Class discussion on what makes someone a mathematician, and what one looks like? Explain that everyone is a mathematician no matter their race, gender, or sexual orientation. Use photos to explain (description of each person). Utilizing this resource and others: https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6 Activity: Students will complete an activity where they either add a real picture or draw a photo of themselves, and adding a short bio, showing that a mathematician can look like you or me.
Differentiation
Teacher assistance as needed
Resources Provided
https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6
Assessments
What does a Mathematician Look Like Activity
Standards
No standards have been assigned to this lesson.
Lesson Documents
No documents have been uploaded to this lesson

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 8

Deal School

Deal, New Jersey

2024
Board of Education

Kay Jannarone, President
Michael Sorrentino, Vice President

Giovanni Astorino
Joseph Nachmani
Joseph Rishty

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

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Course Introduction

The *Big Ideas* program fully aligns with the New Jersey State Learning 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 - Algebra 1

Desired Outcomes

NUMBERS AND QUANTITY

(N.Q) Quantities

NJSLS.MATH.CONTENT.N.Q.A
Reason quantitatively and use units to solve problems
N.Q.A.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Climate Change Example: Students may use units to guide the solution of multi-step problems about how variations in the flow of energy into and out of the Earth's systems result in climate change. Note: Changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.
N.Q.A.2. Define appropriate quantities for the purpose of descriptive modeling.
Climate Change Example: Students may define appropriate quantities for a descriptive model of how variations in the flow of energy into and out of Earth's systems result in climate change. Note: changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.
N.Q.A.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Climate Change Example: Students may**,** when reporting quantities related to how variations in the flow of energy into and out of the Earth's systems result in climate change, choose a level of accuracy appropriate to limitations on how quantities were measured.

ALGEBRA

(SSE) Seeing Structure in Expressions

NJSLS.MATH.CONTENT.A.SSE.A
Interpret the structure of expressions.
A.SSE.A.1. Interpret expressions that represent a quantity in terms of its context. ★
A.SSE.A.1.a. Interpret parts of an expression, such as terms, factors, and coefficients.
A.SSE.A.1.b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor

not depending on P.

NJSLS.MATH.CONTENT.ASSE.A : Seeing Structure in Expressions
Write expressions in equivalent forms to solve problems
A.SSE.B.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★
A.SSE.B.3.a Factor a quadratic expression to reveal the zeros of the function it defines.
A.SSE.B.3.b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
A.SSE.B.3.c. Use the properties of exponents to transform expressions for exponential functions. For example, the expression 1.15^t can be rewritten as $\left(1.15^{1/12}\right)^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

(CED) Creating Equations

NJSLS.MATH.CONTENT.A.CED.A
Creating equations that describe numbers or relationships
A..CED.A.1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.
A.CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
A.CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.
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.
Climate Change Example: Students may rearrange formulas related to the economic impact of climate change to highlight a quantity of interest, using the same reasoning as in solving equations.

(REI) Reasoning with Equations and Inequalities

NJSLS.MATH.CONTENT.A.REI.A
Understanding solving equations as a process of reasoning and explaining the reasoning.
A.REI.A.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

NJSLS.MATH.CONTENT.A.REI.B
Solving equations and inequalities in one variable.
A.REI.B.3.Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.B.4. Solve quadratic equations in one variable.
A.REI.B.4.a. Use the method of completing the square to transform any quadratic equation in *x* into an equation of the form $(x-p)^2=q$ that has the same solutions. Derive the quadratic formula from this form.
A.REI.B.4.b. Solve quadratic equations by inspection (e.g., for $x^2=49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a\pm bi$ for real numbers a and b.

NJSLS.MATH.CONTENT.A.REI.C
Solving systems of equations.
A.REI.C.6. Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables.

NJSLS.MATH.CONTENT.A.REI.D
Represent and solve equations and inequalities graphically.
A.REI.D.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
A.REI.D.11. Explain why the *x*-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=f(x)$ 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.

FUNCTIONS

(F.IF) Interpreting Functions

NJSLS.MATH.CONTENT.A.F.IF.A
Understand the concept of a function and use function notation.
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.
Climate Change Example: Students may use function notation to determine the amount of carbon dioxide produced by burning a given number of molecules of ethane (gasoline), m, where c(m) is the number of molecules of carbon dioxide.
F.IF.A.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

NJSLS.MATH.CONTENT.A.F.IF.B
Interpret functions that arise in applications in terms of the context.
F.IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. ★
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. ★
Climate Change Example: Students may relate the domain of a function c(m) representing the amount of carbon dioxide produced by burning m molecules of ethane (gasoline), to its graph in order to determine the appropriate domain for c(m).
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. ★
Climate Change Example: Students may calculate the average rate of change of a function c(m) presented symbolically or as a table, where c(m) represents the

amount of carbon dioxide produced by burning a given number of molecules of ethane (gasoline).

NJSLS.MATH.CONTENT.A.F.IF.C
Analyze functions using different representations.
F.IF.C.7.Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★
F.IF.C.7.a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
F.IF.C.7.b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
F.IF.C.7.e. Graph exponential and logarithmic functions, showing intercepts and end behavior**.**
F.IF.C.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
F.IF.C.8.a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
F.IF.C.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

(F.BF) Building Functions

NJSLS.MATH.CONTENT.A.F.BF.A
Build a function that models a relationship between two quantities.
F.BF.A.1. Write a function that describes a relationship between two quantities.
F.BF.A.1.a. Determine an explicit expression, a recursive process, or steps for calculation from a context.

NJSLS.MATH.CONTENT.A.F.BF.B
Build new functions from existing functions.
F.BF.B.3. Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, 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.LE) Linear and Exponential Models

NJSLS.MATH.CONTENT.A.F.LE.A
Construct and compare linear and exponential models and solve problems.
F.LE.A.1. Distinguish between situations that can be modeled with linear functions

and with exponential functions.
F.LE.A.1.a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
F.LE.A.1.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
F.LE.A.1.c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
F.LE.A.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
F.LE.A.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
F.LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context.

STATISTICS AND PROBABILITY

(S.ID) Interpreting Categorical and Quantitative Data

NJSLS.MATH.CONTENT.A.S.ID.A
Summarize, represent, and interpret data on a single count or measurement variable.
S.ID.A.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).
Climate Change Example: Students may represent geoscience data, with plots on the real number line, as they analyze results from global climate models.
S.ID.A.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
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).

NJSLS.MATH.CONTENT.A.S.ID.B
Summarize, represent, and interpret data on two categorical and quantitative variables.
S.ID.B.6. Represent data on two quantitative variables on a scatter plot and describe how the variables are related.
Climate Change Example: Students may represent geoscience data on two quantitative variables on a scatter plot and describe how the variables are related in order to analyze the data and the results from global climate models.
S.ID.B.6.a. Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and

exponential models.
Climate Change Example: Students may use linear or exponential functions fitted to geoscience data to solve problems and analyze the results from global climate models to make an evidence-based forecast of the current rate of global climate change.
S.ID.B.6.b. Informally assess the fit of a function by plotting and analyzing residuals, including with the use of technology.
S.ID.B.6.c. Fit a linear function for a scatter plot that suggests a linear association.

NJSLS.MATH.CONTENT.A.S.ID.C
Interpret linear models.
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.
S.ID.C.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.
S.ID.C.9. Distinguish between correlation and causation.

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

• 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. • 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. • Rationalize the denominator. • Use inverse operations in order to solve radical equations.	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 we compare situations using 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 ● 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	● 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 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
- 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 & Diversity, Equity and Inclusion

What does a Mathematician look like?
Analyzing Inclusive Data
Building a Handicap Ramp

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.

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

Use technology to enhance productivity increase collaboration and communicate effectively.

Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.

9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.

9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).

9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.

9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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

NJSLS.RI.CI.8.2. Determine a central idea of an informational text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

NJSLS.L.VI.8.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

NJSLS.SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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

2020 Computer Science and Design Thinking
Computer Science and Design Thinking Practices 1 Fostering an Inclusive Computing and Design Culture 2 Collaborating Around Computing and Design **8.1 Computer Science** 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode. 8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users
Pacing Guide
https://docs.google.com/document/d/1YBLfwJXfGs8cEwaldwMc0Ftp-EmPNlqSEmCLiE_wrug/edit?usp=sharing

Annual Pacing Guide

Grade Level: 8 - Algebra

Subject: Math

September	October	November	December	January
Solving Linear Equations and Inequalities **Ch. 1 Big Ideas**	Graphing Linear Equations **Ch. 2 Big Ideas**	Writing Linear Equations **Ch. 3 Big Ideas**	Solving Systems of Linear Equations **Ch. 4 Big Ideas**	Exponential Functions and Sequences **Ch. 5 Big Ideas**

February	March	April	May	June
Polynomial Equations and Factoring **Ch. 6 Big Ideas**	Graphing Quadratic Functions **Ch. 7 Big Ideas**	Solving Quadratic Equations **Ch. 8 Big Ideas**	Radical Functions and Equations **Ch. 9 Big Ideas**	Data Analysis and Displays **Ch. 10 Big Ideas**

Working document.

Update as needed.

Mining Data

Grade Level: 6-12
Approximate lesson duration: 2-45 minute periods

Unit/Lesson New Jersey Student Learning Standards (NJSLS):

8th grade (Statistics & Probability)
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.
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 (e.g. line of best fit) by judging the closeness of the data points to the line.
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.

HS (Statistics & Probability)
Interpreting Categorical and Quantitative Data
• Summarize, represent, and interpret data on a single count or measurement variable
• Summarize, represent, and interpret data on two categorical and quantitative variables
• Interpret linear models
Making Inferences and Justifying Conclusions
• Understand and evaluate random processes underlying statistical experiments
• Make inferences and justify conclusions from sample surveys, experiments and observational studies

Make inferences and justify conclusions from sample surveys, experiments, and observational studies
3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
6. Evaluate reports based on data

A. Understand independence and conditional probability and use them to interpret data
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

3. Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

Brief Summary of Cultural Competencies Related to the Unit/Lesson:

What makes this lesson culturally relevant? This lesson examines data collected across several demographic indices by publicly available resources. Bivariate data analysis is used to examine the intersection of gender identity, race, class, age and other personal characteristics appear in data sets.

Lesson Overview:

Essential Question(s)	How can climate data be used to make the concerns of LGBT youth visible? How can mathematical models be used to develop agency in a school community?
Enduring Understanding(s)	Data quality can be determined based on the replicability of data/study questions. Data visualizations are models of numeric (quantitative information) that can be used to build understanding.
Potential Misconceptions	All published data are true. Studies/surveys of interest to LGBT youth are limited/non-scientific (invalid) because of their emphasis on self-reports.

Learning Plan, Experiences, Instruction and Learning Activities:

	The Teacher will…model simple data collection and analysis by conducting a bivariate "post it" poll. Teacher creates a frequency table on a large instructional space for public display and guides analysis of larger sample.
W What is expected? ● List the intentional learning objectives on the board	**Students will be able to:** ● **Discuss additional ways to aggregate and disaggregate data** ● **Organize data in multiple ways and discuss/evaluate the merits of each** ● **Create a graphical representation of data**

	Today we will be working on...data analysis and representation. By representing data within the classroom environment, students will create a small case study based on questions available in large sample data sets (GLSEN, ACS)
H How will we hook (Introduce this to) the students? • Activate thinking • Consider the language you will use to introduce the lesson (See example in the table)	**Link to Engagement** *Recently, we…surveyed members of the class to determine characteristics about our birth dates and dietary preferences.* Using different color post its, ask students to identify their birth quarter (Q1: January - March, Q2: April - June, Q3: July - September, Q4: October - December) and primary dietary preference by category (plant-based, meat-based) *Turn and talk to a partner about…what the word PRIMARY means in data collection; additional categories that could be used to get more insight into the members of the community. Examples include vegan, vegetarian, pescetarian, mainly poultry/fish, pork free, all meat; gender identity; age categories* *You are really beginning to understand BASIC STATISTICS. Today, we're going to dig deeper with a new focus. This focus is...DATA ANALYSIS and SAMPLING; MODELING AND STUDY REPLICATION.*
E What equipment, resources, or materials are needed?	GLSEN School Climate Survey 2017 Report https://www.glsen.org/sites/default/files/GLSEN-2017-National-School-Climate-Survey-NSCS-Full-Report.pdf 1. Table 2.2 2. Table 2.4 3. Figure 2.5 4. Figure 2.13 Availability of LGBTQ Inclusive Resources (FIGURE) https://www.glsen.org/sites/default/files/Availability-of-LGBTQ-inclusive-school-resources-GLSEN-NSCS-2017.png American Community Survey (related to U.S. Census) https://www.census.gov/programs-surveys/acs/; DATA sources https://www.census.gov/programs-surveys/acs/data.html
R How will we rethink or revise our thinking throughout the lesson? • What learning is	Using the identified resources from the 2017 GLSEN School Climate Survey, reproduce data collection for the sample of students in the class. From the engagement activity (post-it poll), groups will have slightly different foci: the Q1 group will analyze Table 2.2; Q2 will analyze Table 2.4; Q3 will analyze Figure 2.5 and Q4

confirmed? • What misconceptions are uncovered? • What is your new thinking?	group will analyze Figure 2.13. In small groups, develop a poll question and reproduce the data for the class sample. Discuss ways to expand the study while maintaining the integrity of the study process (anonymity) Compare focal data to the Availability of LGBTQ Inclusive Resources graph. Discuss how these data are different/same. In small groups or as individuals, review data that are available through the American Community Survey (ACS). Create a replicate based on ACS questioning and/or data representations.
E How will students self-evaluate and reflect on their learning?	Students can evaluate how closely their data compare to larger data sets by examining trends. If their representations are significantly different, they can write about why or expand their data collection.
T How will we tailor learning to varied needs, interests, and learning styles?	This lesson can be done as a paper-pencil or technology-supported lesson to meet the specific needs of students/teachers. Several teachers can work together to unpack the data from the suggested reports. Students can prepare a presentation to share the GLSEN and ACS reports with teachers, counselors and advocate for specific programs based on school-based sampling.
O How will we organize the sequence of learning during the lesson?	**Scaffold the Instruction** (1) Model: Post-It Poll shows how to quickly organize data using simple variables. (2) Guided Practice: Using available resources, students reproduce surveys without worrying about phrasing questions or introducing significant bias into data collection. (3) Independent Practice: Students have opportunities to work in small and individual groups to practice data collection and analysis.

Check for Understanding

(Formative evidence such as conferencing, group Q/A, teacher observation, exit-slip, etc.)	Each group will have opportunities to check-in with teachers; production of a final graphical representation of the data will serve as an exit slip
Quiz/Test (optional): (attach copy of assessment)	
Performance Task/Project: (attach rubric)	1. Each group will prepare a summary of their focal data set and class data representation 2. Individual students will use the ACS to re-create a single question poll patterned after small group activity Rubric for presentation available online at https://www.state.nj.us/education/cccs/2009/8.pdf.
Other:	

Supplemental Resources:

- https://www.glsen.org/educate/resources/curriculum
- GLSEN Guide for Best Practices

HANDOUT for STUDENTS

Figure 2.2 Availability of LGBTQ-Related Curricular Resources
(Percentage of LGBTQ Students Reporting Resource in Their School)

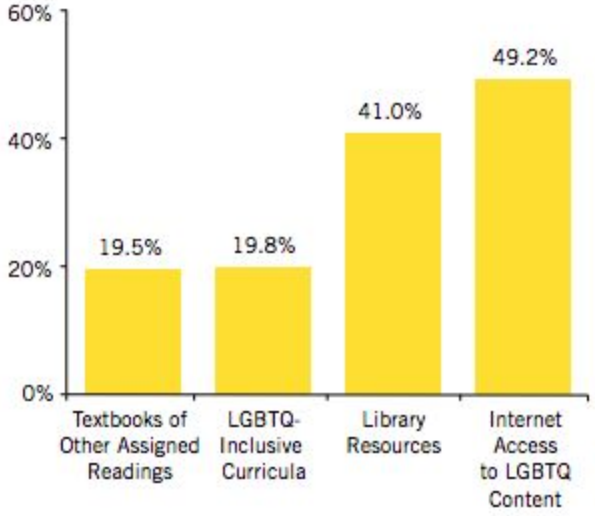


Figure 2.13 School Supports and Peer Acceptance of LGBTQ People
(Percentage of LGBTQ Students Reporting that Their Peers Were Somewhat or Very Accepting)

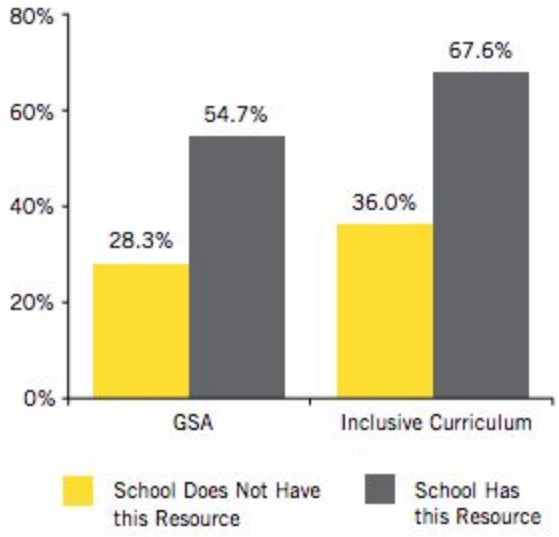


Table 2.2 Positive Representations of LGBTQ-Related Topics Taught in Class

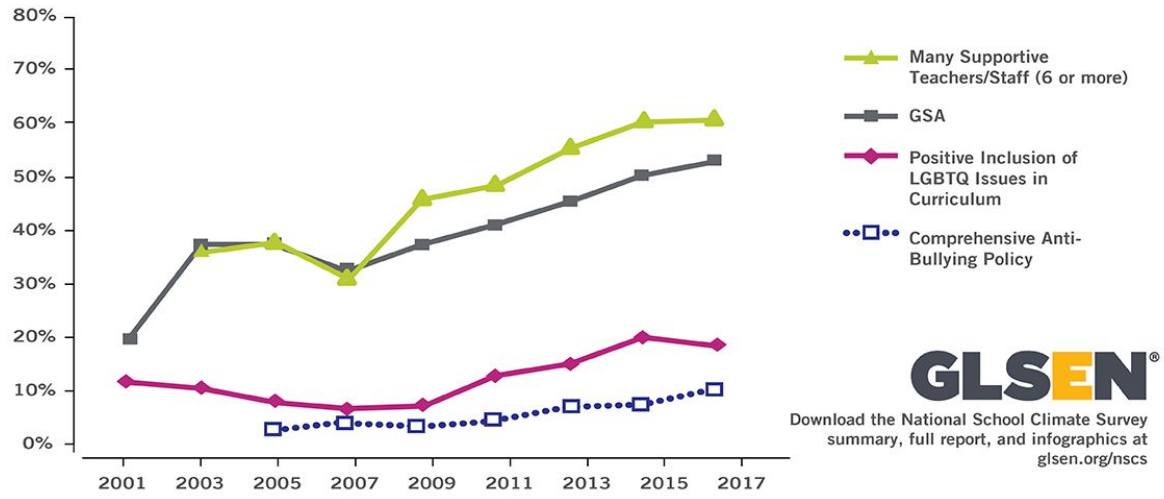
Classes	% of LGBTQ Students Taught Positive Rep of LGBTQ-Related Topics (n = 4419)	% of all LGBTQ Students in Survey (n = 22760)
History or Social Studies	58.5%	11.4%
English	39.5%	7.7%
Health	25.0%	4.9%
Art	15.8%	3.1%
Music	12.9%	2.5%
Science	12.2%	2.4%
Foreign Language	11.2%	2.2%
Psychology	10.7%	2.1%
Sociology	6.6%	1.3%
Gym or Physical Education	5.9%	1.2%
Math	4.8%	0.9%
Other Class (e.g., Drama, Advisory)	8.7%	1.7%

Table 2.4 Transgender and Gender Nonconforming (Trans/GNC) Students'* Reports of Areas Addressed in Trans/GNC Student School Policies and Official Guidelines

	% of Trans/ GNC Students with Policy	% of All Trans/ GNC Students in Survey
Use pronoun/name of choice	82.7%	9.4%
Use bathrooms that match gender identity (boys or girls)	72.8%	8.3%
Access gender neutral bathroom	62.2%	7.1%
Change official school records after name or gender change	55.1%	6.3%
Participate in extracurricular activities that match gender identity (non-sports)	51.9%	5.9%
Dress codes/school uniforms match gender identity	48.4%	5.5%
Locker rooms that match gender identity	45.9%	5.2%
Participate in school sports that match gender identity	42.4%	4.8%
Stay in housing during field trips or in dorms that match gender identity	25.5%	2.9%
Another topic not listed (e.g., confidentiality policies, education for school community)	1.6%	0.2%

*Trans/GNC students refers to all non-cisgender students in the survey sample, including transgender students, genderqueer students, other nonbinary students, students questioning their gender, and other students who do not identity as cisgender (e.g., demigender).

Availability of LGBTQ-Related School Resources Over Time
(Percentage of LGBTQ Students Reporting Resource in School, Accounting for Covariates)



Avaiable online at
https://www.glsen.org/sites/default/files/Availability-of-LGBTQ-inclusive-school-resources-GLSEN-NSCS-2017.png

Pre-Alg 8

Inclusive Lessons, Gr 8 - Pythagorean Theorem: Build a Ramp

Scheduled to be taught on 02/15

Created by Quackenbush, Tiffany

21st Century Skills

*Communication and Collaboration
*Creativity and Innovation
*Critical Thinking and Problem Solving
*Life and Career Skills

Goals and Objectives

Students will be able to sketch a real life handicap ramp to scale.

Learning Activities or Instructional Strategies

Warm Up: Pictures of handicap entrances, discuss what they notice and wonder.

Project Intro: Discuss that our school does not have a handicap ramp to get directly to the gym. Explain that they will be responsible for creating a ramp compliant with ADA requirements which they will have to research.

Project: Students will work with groups to create a ramp, if possible given the space. Students are require to do research on regulations which involves specific slopes, and draw a blueprint. They will be using the pythagorean theorem to help calculate the cost of the ramp.

Differentiation

Teacher will select group members
Teacher assistance as needed

Resources Provided

Graph Paper

ADA Regulations:
https://www.ada-compliance.com/ada-compliance/ada-ramp

Assessments

Project

Standards

1. 4.5K Grade 8 CPI 2
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
2. 4.5K Grade 8 CPI 3
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Lesson Documents

No documents have been uploaded to this lesson

Pre-Alg 8

Inclusive Lessons, What does a Mathematician Look Like?

Scheduled to be taught on 02/14

Created by Quackenbush, Tiffany

21st Century Themes
*Global Awareness
21st Century Skills
*Creativity and Innovation
Goals and Objectives
STANDARD: N.J.S.A. 18A:35-4.35-36 Students will be able to see that mathematicians are diverse and see themselves as a mathematician.
Learning Activities or Instructional Strategies
Warm Up: Students will draw what they believe a mathematician looks like. Discussion: Show photos of diverse people in the stem profession including mathematicians. Ask students to notice and wonder. Class discussion on what makes someone a mathematician, and what one looks like? Explain that everyone is a mathematician no matter their race, gender, or sexual orientation. Use photos to explain (description of each person). Utilizing this resource and others: https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6 Activity: Students will complete an activity where they either add a real picture or draw a photo of themselves, and adding a short bio, showing that a mathematician can look like you or me.
Differentiation
Teacher assistance as needed
Resources Provided
https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6
Assessments
What does a Mathematician Look Like Activity
Standards
No standards have been assigned to this lesson.
Lesson Documents
No documents have been uploaded to this lesson

Deal School Curriculum
Grade 8 Mathematics – The Number System

Desired Outcomes

NJSLS.MATH.CONTENT.8.NS.A.
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., π^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.
NJSLS.MATH.CONTENT.8.NS.A.3
Understand that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

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….**
● Numbers that are not rational are called irrational. ● Every number has a decimal expansion. ● The decimal expansion for rational numbers repeats	● 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 can be converted into a number. ● rational approximations of irrational numbers tare used o compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.	eventually. ● Convert a decimal expansion, which repeats eventually into a rational number. ● 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., $\pi 2$).

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 & Diversity, Equity and Inclusion
What does a Mathematician look like?

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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>
NJSLS.RI.CI.8.2. Determine a central idea of an informational text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and

diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

NJSLS.L.VI.8.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

NJSLS.SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users
Pacing Guide
https://docs.google.com/document/d/12hRsn4AiovofkYiH3xgVoyrN35_U4Q6zCsqXpXTD43c/edit?usp=sharing

Deal School Curriculum
Grade 8 Mathematics – Expressions and Equations

Desired Outcomes

NJSLS.MATH.CONTENT.8.EE.A
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, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$.
NJSLS.MATH.CONTENT.8.EE.A.2
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ where p is a positive rational number.

a. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

b. Simplify numerical radicals, limiting to square roots (i.e. nonperfect squares). For example, simplify $\sqrt{8}$ to $2\sqrt{2}$.

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 3×10^8 and the population of the world as 7×10^9 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.

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

NJSLS.MATH.CONTENT.8.EE.C
Analyze and solve linear equations and pairs of simultaneous linear equations.
NJSLS.MATH.CONTENT.8.EE.C.7
Solve linear equations in one variable.

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).
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.

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.
b. Solve systems of two linear equations in two variables using the substitution method and estimate solutions by graphing the equations. Solve simple cases by inspection. For example: by inspection, conclude that $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6. Solve $3x + y = 30$ and $y = 2x$ using the substitution method; Solve $y = 3x + 1$ and $y = -2x + 7$ using the substitution method.
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	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. How do we know if a radical expression is in simplest form?

equivalence to transform equations and inequalities so solutions can be found. 5. Radical expressions must be in simplest form.	
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. ● 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.	● 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. ● Use scientific notation to express very large or very small numbers. ● Solve problems using addition, subtraction or multiplication, expressing the answer in scientific notation.
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	

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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LGBTQ+ and Disabilities & Diversity, Equity and Inclusion

What does a Mathematician look like?

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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

NJSLS.RI.CI.8.2. Determine a central idea of an informational text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

NJSLS.L.VI.8.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
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NJSLS.SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

Science Connection

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

the solar system.

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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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

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Deal School Curriculum
Grade 8 Mathematics – Functions

Desired Outcomes

NJSLS.MATH.CONTENT.8.F.A
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. (Clarification: Function notation is not required in Grade 8)
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 $A = s^2$ 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.

NJSLS.MATH.CONTENT.8.F.B
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 verbally.

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….**
● 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.**
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
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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
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- Big Ideas Math Manipulative Kit
- Student Edition
- Teaching Edition
- Family Letters
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- 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
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- Graphic organizers
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- Smart Notebook

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Deal School Curriculum
Grade 8 Mathematics – Geometry

Desired Outcomes

NJSLS.MATH.CONTENT.8.G.A

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 lines, and 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.

NJSLS.MATH.CONTENT.8.G.B

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.

NJSLS.MATH.CONTENT.8.G.C
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. Climate Change Example: Students may use the formula for the volume of a sphere to approximate the volume of hailstones to consider how climate change may affect the size of hailstones over time.

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….**
● 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	● 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

can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. ● 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.	reflections on two-dimensional figures using coordinates. ● 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. ● 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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<u>Formative Assessments</u> Homework Checklist Assessments Center Products Writing Samples	

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Desired Outcomes

NJSLS.MATH.CONTENT.8.SP.A
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. Climate Change Example: Students may construct and interpret scatterplots of measurement data to investigate patterns of association in bivariate data involving the amount of a greenhouse gas in the atmosphere and its effect on temperature.
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 (e.g. line of best 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. Climate Change Example: Students may use the equation of a linear model to interpret the slope when comparing local and global precipitation rates for rainfall in different regions.
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.	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….**
• Scatter plots for bivariate measurement data are 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.	• 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. • 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.
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 & Diversity, Equity and Inclusion

What does a Mathematician look like?

Analyzing Inclusive Data

2020 Career Readiness, Life Literacies and Key Skills

Career Ready Practices

Demonstrate creativity and innovation.

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

Use technology to enhance productivity increase collaboration and communicate effectively.
Work productively in teams while using cultural/global competence.

9.1 Personal Financial Literacy

9.1.8.CP.1: Compare prices for the same goods or services.
9.1.8.PB.5: Identify factors that affect one's goals, including peers, culture, location, and past experiences.

9.3 Career and Technical Education

9.3.12.ED.1 Apply communication skills with students, parents and other groups to enhance learning and a commitment to learning.
9.3.12.ED.2 Demonstrate effective oral, written and multimedia communication in multiple formats and contexts.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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

NJSLS.RI.CI.8.2. Determine a central idea of an informational text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLS.RI.CR.8.1. Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

NJSLS.L.VI.8.4. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

-Interpret figures of speech (e.g., personification) in context.
-Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
-Analyze the impact of a specific word choice on meaning and tone.
-Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

NJSLS.SL.II.8.2. Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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

2020 Computer Science and Design Thinking

Computer Science and Design Thinking Practices

1 Fostering an Inclusive Computing and Design Culture

2 Collaborating Around Computing and Design

8.1 Computer Science

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users

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
Equations (Expressions and Equations) **Ch. 1 Big Ideas**	Functions (Functions) **Ch. 7 Big Ideas**	Graphing and Writing Linear Equation (Expressions and Equations) **Ch. 4 Big Ideas**	Systems of Linear Equations (Expressions and Equations) **Ch. 5 Big Ideas**	Transformations (Geometry) **Ch. 2 Big Ideas**

February	March	April	May	June
Angles and Triangles (Geometry) **Ch. 3 Big Ideas**	Exponents and Scientific Notation (Expressions and Equations) **Ch. 8 Big Ideas**	Real Numbers and the Pythagorean Theorem (Number System) (Geometry) **Ch. 9 Big Ideas**	Volume and Similar Solids (Geometry) **Ch. 10 Big Ideas**	Data Analysis and Displays (Statistics and Probability) **Ch. 6 Big Ideas**

Pre-Alg 8

Inclusive Lessons, What does a Mathematician Look Like?

Scheduled to be taught on 02/14

Created by Quackenbush, Tiffany

21st Century Themes
*Global Awareness
21st Century Skills
*Creativity and Innovation
Goals and Objectives
STANDARD: N.J.S.A. 18A:35-4.35-36 Students will be able to see that mathematicians are diverse and see themselves as a mathematician.
Learning Activities or Instructional Strategies
Warm Up: Students will draw what they believe a mathematician looks like. Discussion: Show photos of diverse people in the stem profession including mathematicians. Ask students to notice and wonder. Class discussion on what makes someone a mathematician, and what one looks like? Explain that everyone is a mathematician no matter their race, gender, or sexual orientation. Use photos to explain (description of each person). Utilizing this resource and others: https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6 Activity: Students will complete an activity where they either add a real picture or draw a photo of themselves, and adding a short bio, showing that a mathematician can look like you or me.
Differentiation
Teacher assistance as needed
Resources Provided
https://www.teacherspayteachers.com/Product/41-Influential-and-Diverse-People-in-STEM-6646536?st=1182d29c9fe37591827a6ef5565666a6
Assessments
What does a Mathematician Look Like Activity
Standards
No standards have been assigned to this lesson.
Lesson Documents
No documents have been uploaded to this lesson

Mining Data

Grade Level: 6-12
Approximate lesson duration: 2-45 minute periods

Unit/Lesson New Jersey Student Learning Standards (NJSLS):

8th grade (Statistics & Probability)
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.
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 (e.g. line of best fit) by judging the closeness of the data points to the line.
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.

HS (Statistics & Probability)
Interpreting Categorical and Quantitative Data
• Summarize, represent, and interpret data on a single count or measurement variable
• Summarize, represent, and interpret data on two categorical and quantitative variables
• Interpret linear models
Making Inferences and Justifying Conclusions
• Understand and evaluate random processes underlying statistical experiments
• Make inferences and justify conclusions from sample surveys, experiments and observational studies

Make inferences and justify conclusions from sample surveys, experiments, and observational studies
3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
6. Evaluate reports based on data

A. Understand independence and conditional probability and use them to interpret data
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

3. Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

Brief Summary of Cultural Competencies Related to the Unit/Lesson:

What makes this lesson culturally relevant? This lesson examines data collected across several demographic indices by publicly available resources. Bivariate data analysis is used to examine the intersection of gender identity, race, class, age and other personal characteristics appear in data sets.

Lesson Overview:

Essential Question(s)	How can climate data be used to make the concerns of LGBT youth visible? How can mathematical models be used to develop agency in a school community?
Enduring Understanding(s)	Data quality can be determined based on the replicability of data/study questions. Data visualizations are models of numeric (quantitative information) that can be used to build understanding.
Potential Misconceptions	All published data are true. Studies/surveys of interest to LGBT youth are limited/non-scientific (invalid) because of their emphasis on self-reports.

Learning Plan, Experiences, Instruction and Learning Activities:

	The Teacher will…model simple data collection and analysis by conducting a bivariate "post it" poll. Teacher creates a frequency table on a large instructional space for public display and guides analysis of larger sample.
W What is expected? ● List the intentional learning objectives on the board	**Students will be able to:** ● **Discuss additional ways to aggregate and disaggregate data** ● **Organize data in multiple ways and discuss/evaluate the merits of each** ● **Create a graphical representation of data**

	Today we will be working on...data analysis and representation. By representing data within the classroom environment, students will create a small case study based on questions available in large sample data sets (GLSEN, ACS)
H How will we hook (Introduce this to) the students? • Activate thinking • Consider the language you will use to introduce the lesson (See example in the table)	**Link to Engagement** *Recently, we…surveyed members of the class to determine characteristics about our birth dates and dietary preferences.* Using different color post its, ask students to identify their birth quarter (Q1: January - March, Q2: April - June, Q3: July - September, Q4: October - December) and primary dietary preference by category (plant-based, meat-based) *Turn and talk to a partner about…what the word PRIMARY means in data collection; additional categories that could be used to get more insight into the members of the community. Examples include vegan, vegetarian, pescetarian, mainly poultry/fish, pork free, all meat; gender identity; age categories* *You are really beginning to understand BASIC STATISTICS. Today, we're going to dig deeper with a new focus. This focus is...DATA ANALYSIS and SAMPLING; MODELING AND STUDY REPLICATION.*
E What equipment, resources, or materials are needed?	GLSEN School Climate Survey 2017 Report https://www.glsen.org/sites/default/files/GLSEN-2017-National-School-Climate-Survey-NSCS-Full-Report.pdf 1. Table 2.2 2. Table 2.4 3. Figure 2.5 4. Figure 2.13 Availability of LGBTQ Inclusive Resources (FIGURE) https://www.glsen.org/sites/default/files/Availability-of-LGBTQ-inclusive-school-resources-GLSEN-NSCS-2017.png American Community Survey (related to U.S. Census) https://www.census.gov/programs-surveys/acs/; DATA sources https://www.census.gov/programs-surveys/acs/data.html
R How will we rethink or revise our thinking throughout the lesson? • What learning is	Using the identified resources from the 2017 GLSEN School Climate Survey, reproduce data collection for the sample of students in the class. From the engagement activity (post-it poll), groups will have slightly different foci: the Q1 group will analyze Table 2.2; Q2 will analyze Table 2.4; Q3 will analyze Figure 2.5 and Q4

confirmed? • What misconceptions are uncovered? • What is your new thinking?	group will analyze Figure 2.13. In small groups, develop a poll question and reproduce the data for the class sample. Discuss ways to expand the study while maintaining the integrity of the study process (anonymity) Compare focal data to the Availability of LGBTQ Inclusive Resources graph. Discuss how these data are different/same. In small groups or as individuals, review data that are available through the American Community Survey (ACS). Create a replicate based on ACS questioning and/or data representations.
E How will students self-evaluate and reflect on their learning?	Students can evaluate how closely their data compare to larger data sets by examining trends. If their representations are significantly different, they can write about why or expand their data collection.
T How will we tailor learning to varied needs, interests, and learning styles?	This lesson can be done as a paper-pencil or technology-supported lesson to meet the specific needs of students/teachers. Several teachers can work together to unpack the data from the suggested reports. Students can prepare a presentation to share the GLSEN and ACS reports with teachers, counselors and advocate for specific programs based on school-based sampling.
O How will we organize the sequence of learning during the lesson?	**Scaffold the Instruction** (1) Model: Post-It Poll shows how to quickly organize data using simple variables. (2) Guided Practice: Using available resources, students reproduce surveys without worrying about phrasing questions or introducing significant bias into data collection. (3) Independent Practice: Students have opportunities to work in small and individual groups to practice data collection and analysis.

Check for Understanding

(Formative evidence such as conferencing, group Q/A, teacher observation, exit-slip, etc.)	Each group will have opportunities to check-in with teachers; production of a final graphical representation of the data will serve as an exit slip
Quiz/Test (optional): (attach copy of assessment)	
Performance Task/Project: (attach rubric)	1. Each group will prepare a summary of their focal data set and class data representation 2. Individual students will use the ACS to re-create a single question poll patterned after small group activity Rubric for presentation available online at https://www.state.nj.us/education/cccs/2009/8.pdf.
Other:	

Supplemental Resources:

- https://www.glsen.org/educate/resources/curriculum
- GLSEN Guide for Best Practices

HANDOUT for STUDENTS

Figure 2.2 Availability of LGBTQ-Related Curricular Resources
(Percentage of LGBTQ Students Reporting Resource in Their School)

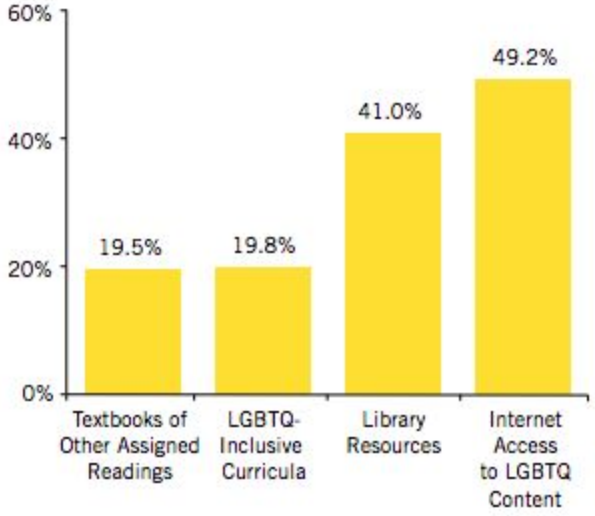


Figure 2.13 School Supports and Peer Acceptance of LGBTQ People
(Percentage of LGBTQ Students Reporting that Their Peers Were Somewhat or Very Accepting)

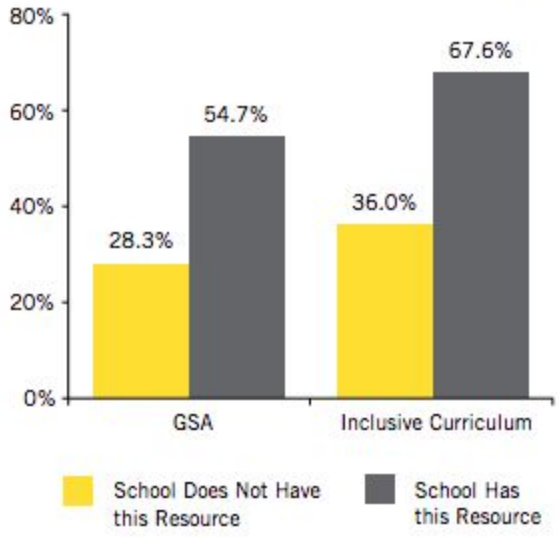


Table 2.2 Positive Representations of LGBTQ-Related Topics Taught in Class

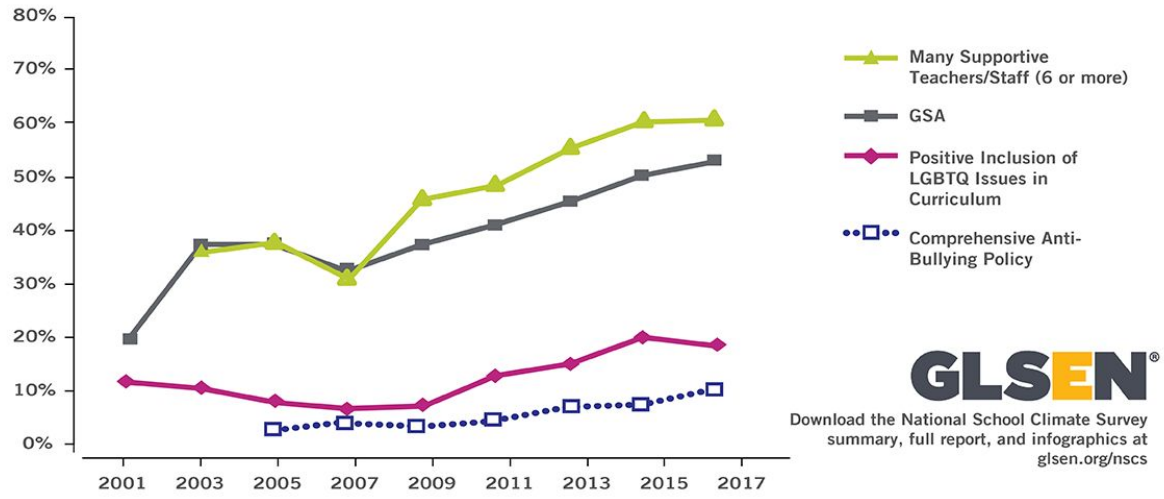
Classes	% of LGBTQ Students Taught Positive Rep of LGBTQ-Related Topics (n = 4419)	% of all LGBTQ Students in Survey (n = 22760)
History or Social Studies	58.5%	11.4%
English	39.5%	7.7%
Health	25.0%	4.9%
Art	15.8%	3.1%
Music	12.9%	2.5%
Science	12.2%	2.4%
Foreign Language	11.2%	2.2%
Psychology	10.7%	2.1%
Sociology	6.6%	1.3%
Gym or Physical Education	5.9%	1.2%
Math	4.8%	0.9%
Other Class (e.g., Drama, Advisory)	8.7%	1.7%

Table 2.4 Transgender and Gender Nonconforming (Trans/GNC) Students'* Reports of Areas Addressed in Trans/GNC Student School Policies and Official Guidelines

	% of Trans/ GNC Students with Policy	% of All Trans/ GNC Students in Survey
Use pronoun/name of choice	82.7%	9.4%
Use bathrooms that match gender identity (boys or girls)	72.8%	8.3%
Access gender neutral bathroom	62.2%	7.1%
Change official school records after name or gender change	55.1%	6.3%
Participate in extracurricular activities that match gender identity (non-sports)	51.9%	5.9%
Dress codes/school uniforms match gender identity	48.4%	5.5%
Locker rooms that match gender identity	45.9%	5.2%
Participate in school sports that match gender identity	42.4%	4.8%
Stay in housing during field trips or in dorms that match gender identity	25.5%	2.9%
Another topic not listed (e.g., confidentiality policies, education for school community)	1.6%	0.2%

*Trans/GNC students refers to all non-cisgender students in the survey sample, including transgender students, genderqueer students, other nonbinary students, students questioning their gender, and other students who do not identity as cisgender (e.g., demigender).

Availability of LGBTQ-Related School Resources Over Time
(Percentage of LGBTQ Students Reporting Resource in School, Accounting for Covariates)



Avaiable online at
https://www.glsen.org/sites/default/files/Availability-of-LGBTQ-inclusive-school-resources-GLSEN-NSCS-2017.png

Pre-Alg 8

Inclusive Lessons, Gr 8 - Pythagorean Theorem: Build a Ramp

Scheduled to be taught on 02/15

Created by Quackenbush, Tiffany

21st Century Skills

*Communication and Collaboration
*Creativity and Innovation
*Critical Thinking and Problem Solving
*Life and Career Skills

Goals and Objectives

Students will be able to sketch a real life handicap ramp to scale.

Learning Activities or Instructional Strategies

Warm Up: Pictures of handicap entrances, discuss what they notice and wonder.

Project Intro: Discuss that our school does not have a handicap ramp to get directly to the gym. Explain that they will be responsible for creating a ramp compliant with ADA requirements which they will have to research.

Project: Students will work with groups to create a ramp, if possible given the space. Students are require to do research on regulations which involves specific slopes, and draw a blueprint. They will be using the pythagorean theorem to help calculate the cost of the ramp.

Differentiation

Teacher will select group members
Teacher assistance as needed

Resources Provided

Graph Paper

ADA Regulations:
https://www.ada-compliance.com/ada-compliance/ada-ramp

Assessments

Project

Standards

1. 4.5K Grade 8 CPI 2
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
2. 4.5K Grade 8 CPI 3
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Lesson Documents

No documents have been uploaded to this lesson