



Totowa Public Schools

Mathematics

Grade 5

Aligned to NJSL Standards

BOE Adopted: 8/31/2022

Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1: Understanding the Place Value System	8 Weeks	
Unit 2: Operations with Multi-digit Whole Numbers, Decimals, & Fractions	8 Weeks	
Unit 3: Fraction Multiplication & Division	8 Weeks	
Unit 4: Geometric Measures & Understanding Volume	8 Weeks	
Unit 5: Shape and Coordinate Geometry	4 Weeks	

Title	Understanding the Place Value System
Unit Duration	8 Weeks
Unit Summary & Rationale	Unit 1 begins with a benchmark to show baseline understanding for standard 5.NBT.5 requiring students to fluently multiply multi-digit whole numbers using the standard algorithm; this standard is repeated in units 3 and 5 to assess for full proficiency. Students also extend their understanding of place value to decimals and find whole-number quotients of whole numbers (4-digits by 2-digits).
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • Unit Essential Questions: • How does our number system work with regards to understanding place value? • How can the relationship of place value be described or explained? • Why does evaluating numerical expressions using the order of operations help show the relationship among numbers? • How can models be used to explain the properties of addition and subtraction with decimals? • Why should grouping be used when solving mathematical operations? • Why is it important to see the connecting or sequence in patterns? • How does understanding place value help you solve quotients of 4-digit dividends and 2-digit divisors? • What makes rounding an effective strategy when working with decimals? • How can you use equations, models, and arrays to show division calculation? • What makes estimation reasonable?
Enduring Understandings	<ul style="list-style-type: none"> • Unit Enduring Understandings: • Knowing the proper place value of the number system is an integral concept of numbers, for example working with money. • Being able to explain the effects of moving from one place value to another, shows understanding of number concepts.

	<ul style="list-style-type: none"> • Patterns appear in everyday real-life situations, and recognizing the sequence can help to simplify problems. • Parts of mathematical expressions must be done first in order to achieve the correct answer. • Grouping operations in mathematical expressions must be understood to place the parts of a word problem in correct order to compute answers accurately. • Division is a lifelong skill and knowing place value will ensure proper placement in the quotient. • Rounding is an effective strategy to estimate your answer and check for reasonableness. • Differentiated instruction using models and arrays helps students apply skills.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to evaluate numerical expressions with grouping symbols. • Be able to write and interpret numerical expressions when given a word problem or a scenario in words. • Be able to explain the “ten times” or 1/10 relationships for place values in multi-digit numbers moving right or left across the places. • Be able to recognize and explain patterns of the number of zeros and the placement of the decimal point in a product or quotient when a number is multiplied or divided by powers of 10. • Be able to compare decimals to thousandths based on the value of the digits in each place using symbols when presented in different notations. • Be able to round a decimal to any place. • Be able to multiply 3-digit whole numbers by 1-digit whole numbers. • Be able to calculate whole number quotients.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning,

	Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	<ul style="list-style-type: none"> • Create problems that use the order of operations. • Work in pairs to match algebraic expressions with mathematical terms that describe them.
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	<ul style="list-style-type: none"> • Use a place value chart to gain understanding of powers of 10. Incorporate money and financial records to display understanding of place value. • Use base-ten blocks to model powers of 10.

<p>to its right and $1/10$ of what it represents in the place to its left.</p> <p>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.</p> <p>5.NBT.A.3. Read, write, and compare decimals to thousandths.</p> <p>5.NBT.A.3a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.</p> <p>5.NBT.A.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p> <p>5.NBT.A.4. Use place value understanding to round decimals to any place.</p>	<ul style="list-style-type: none"> • Pairs of students play a card game in which they use place values to compare and order numbers. • Draw number lines to find the closest number to round to.
<p>5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p> <p>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</p>	<ul style="list-style-type: none"> • Play “I have... Who has...” to review multiplication facts. Use multiplication flash cards to line up and leave the classroom. • Use base-ten blocks to model the dividend, and group the divisor.

division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

NJ: 2016 SLS: English Language Arts

- RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.5.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
- W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- L.5.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

- 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.
- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

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Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence

- 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

Interdisciplinary/21st Century Connections

Science	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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Title	Operations with Multi-digit Whole Numbers, Decimals and Fractions
Unit Duration	8 Weeks
Unit Summary & Rationale	Unit 2 extends operations with multi-digit whole numbers to include operations with decimals to hundredths and fractions.
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • Why is it important to have students communicate precisely using decimals and fractions? • How can models help you to understand the conversion of different sized standard measurement units in the real world? • Why is understanding the place value system important in accurately multiplying multi-digit numbers? • What different models and strategies can show the relationship of adding, subtracting, multiplying and dividing decimals to the hundredths? • What makes an estimation reasonable? • What types of real-world math problems require the operations of addition and subtraction of fractions to find a solution?
Enduring Understandings	<ul style="list-style-type: none"> • Mathematical real-world situations require that people proficiently apply the skills of decimals and fractions to correctly formulate answers to problems. • Models enable a learner to discover and extend their understanding of real-world situations.

	<ul style="list-style-type: none"> • Developing fluency, in place value system is essential for accurately multiplying multi-digit numbers. • Various models and strategies, such as working backwards, drawing diagrams, using manipulatives, help connect student’s learning to real life situations. • Estimation is an important concept for real life in making quick, accurate decisions; estimation in math helps students’ reason and make sense of quantities. • Approaches to real world math problems are a skill requiring addition and subtraction of fractions especially in a career of science.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to describe the place value of numeral digits relative to both the place to the right and the place to the left. • Be able to add, subtract, multiply, and divide decimals to hundredths. • Be able to convert standard measurement units within the same system. • Be able to add and subtract fractions & mixed numbers with unlike denominators. • Be able to solve word problems involving adding or subtracting fractions. • Be able to interpret a fraction as a division of the numerator by the denominator. • Be able to multiply multi-digit whole numbers.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA

	Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
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.	<ul style="list-style-type: none"> Using a straightedge, divide a square piece of paper into 10 equal rectangles, then divide each rectangle into 10 equal squares. Enlarge the square and divide it into 10 equal rectangles to model 1, .1, .01, & .001
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.	<ul style="list-style-type: none"> Use base-ten blocks to model decimals and find the difference between two decimals.

<p>5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</p>	<ul style="list-style-type: none"> • Learn the story of King Henry and his chocolate milk.
<p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> • Use fraction strips to add & subtract fractions that have different denominators. • Draw a number line and use benchmarks to find reasonable estimates.
<p>5.NF.B.3. 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, e.g., by using visual fraction models or equations to represent the problem.</p>	<ul style="list-style-type: none"> • Fold and cut construction paper into equal pieces.

<p>5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<ul style="list-style-type: none"> • Play Multiplication Roll ‘em to review multiplication facts. Use multiplication flash cards to line up and leave the classroom.
Mathematical Practices	
<ul style="list-style-type: none"> • MP.1. Make sense of problems and persevere in solving them. • MP.2. Reason abstractly and quantitatively. • MP.3. Construct viable arguments and critique the reasoning of others. • MP.4. Model with mathematics. • MP.5. Use appropriate tools strategically. • MP.6. Attend to precision. • MP.7. Look for and make use of structure. • MP.8. Look for and express regularity in repeated reasoning. 	
NJ: 2016 SLS: English Language Arts	
<ul style="list-style-type: none"> • RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. • RI.5.5. Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts. • RI.7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words • W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • W.5.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences. 	

- W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
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2020 SLS: Computer Science & Design Thinking

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- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
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Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
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Interdisciplinary/21st Century Connections

Science	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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Title	Fraction Multiplication by a Whole Number and Scaling
Unit Duration	8 Weeks
Unit Summary & Rationale	In unit 3 the notion of fraction multiplication is given in the general case and students solve word problems requiring the multiplication of fractions and whole numbers and division of fractions and unit fractions.
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • Where would you use multiplication of fractions in real world situations? • How can models be used to demonstrate multiplication of fractions by fractions? • How can you compare sizes of one product to another help to understand the relationship between two types of problems?

	<ul style="list-style-type: none"> • Why would you need to know how to solve real world problems involving multiplication of fractions and mixed numbers? • What is the relationship between multiplying and dividing fractions? • What makes an estimation reasonable?
Enduring Understandings	<ul style="list-style-type: none"> • Multiplication is a necessary math skill to communicate precisely and accurately to others in real world situations. • Models are an essential tool especially for differentiating instruction to meet the needs of all students; they can help students interpret mathematical results in the context. • Multiplication of fractions and mixed numbers are found in many careers and knowledge of how to calculate them efficiently will help ensure a life-long skill. • Sufficient familiarity of relationships of fractions will help students develop good number sense and be proficient in calculating products and quotients. • Estimation is an important concept for real life in making quick, accurate decisions; practice estimation in math helps students, reason and make sense of quantities.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to multiply fractions by whole numbers and draw visual models or create story contexts. Be able to interpret the product $(a/b) \times q$ as a part of a whole partitioned into b equal parts added q times. • Be able to find the area of a rectangle with fractional side lengths. • Be able to explain how a product is related to the magnitude of the factors. • Be able to solve real world problems involving multiplication of fractions and mixed numbers using visual fraction models or equations to represent the problem. • Be able to divide a unit fraction by a whole number and a whole number by a unit fraction. • Be able to divide fractions and interpret by creating a story context or visual fraction model. • Be able to solve real world problems involving division of unit fractions by a whole number.

Assessment Evidence

Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
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Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
5.NF.B.3. 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, e.g., by using visual fraction models or equations to represent the problem.	<ul style="list-style-type: none"> • Use counters to find a fractional part of a group. Fold construction paper vertically and horizontally into equal parts. Use this area model to show the product of two fractions. • Place 2 whole fraction strips side-by-side. Find fraction strips with the same denominator that fit exactly under the two wholes. • Work in pairs to identify in the problem: what needs to be found, what information needs to be used, and how will it be used.

5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

5.NF.B.4a. 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 $a \times q \div b$.

5.NF.B.4b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

5.NF.B.5. Interpret multiplication as scaling (resizing), by:

5.NF.B.5a. 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.

5.NF.B.5b. 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

- Draw a number line and label equal fractions on the line.
- Use fraction strips to divide a fraction by a whole number

number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

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.

5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

5.NF.B.7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

5.NF.B.7b. Interpret division of a whole number by a unit fraction, and compute such quotients.

5.NF.B.7c. 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

Mathematical Practices

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2020 SLS: Computer Science & Design Thinking

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Interdisciplinary/21st Century Connections

Science

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.

21st Century Connections

- Creativity and Innovation
- Critical thinking
- Collaboration and Teamwork
- Problem Solving

Title	Geometric Measures and Understanding Volume
Unit Duration	8 Weeks
Unit Summary & Rationale	In unit 4 the focus is geometric measures including volume. Students relate volume to the properties of addition and multiplication and solve problems requiring application of these operations.
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • How do you represent the volume of a solid figure? • Why is it important to know the different types of volume measurement? • How does the area of a composite figure related to the contest of volume? • How can you relate volume to the operations of multiplication and addition? • When do we use geometric measurement of three (3) dimensional figures in a real world setting?
Enduring Understandings	<ul style="list-style-type: none"> • Models can help to explore the concepts of volume in a geometric figure. • Unit cubes are one way to represent the measurement of volume. • Volume can be related to the operations of multiplication and division by filling rectangular prisms with cubes and looking at the relationship between the total volume and area of the base. • Knowing that a cube is one unit by one unit by one unit (cubic unit), students can then develop their understanding of volume. • Models of cubes in inches, centimeters, and feet are helpful for students to develop images.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to measure volume by counting the total number of same size cubic units required to fill a figure. • Be able to choose an appropriate cubic unit based on the attributes of the 3-dimensional figure being measured. • Be able to show that the volume of a right rectangular prism found by counting all the unit cubes is the same as the formulas $V = l \times w \times h$ or $V = B \times h$. • Be able to explain how both volume formulas relate to counting the cubes in one layer and multiplying that value by the number of layers (height). • Be able to find the volume of a composite solid figure composed of two non-overlapping right rectangular prisms.

- Be able to apply formulas to solve real world and mathematical problems involving volumes of right rectangular prisms and composites of the same.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLs	Activity
5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	<ul style="list-style-type: none"> • Construct a rectangular prism and use centimeter cubes to fill the base of the prism.

<p>5.MD.C.3a. 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.</p> <p>5.MD.C.3b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.</p>	
<p>5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.</p>	<ul style="list-style-type: none"> • Construct a rectangular prism, and use the prism to estimate and compare the volume of the two boxes.
<p>5.MD.C.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>5.MD.C.5a. 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.</p> <p>5.MD.C.5b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.</p>	<ul style="list-style-type: none"> • Count the square foot tiles in the classroom in order to find the base area of a rectangular prism. • Use a graphic organizer to solve problems using the volume formulas. • Construct a 3-dimensional composed figure and break it apart into 2 rectangular prisms. • Make a table using information from the problem, then use the table to solve the problem.

Mathematical Practices	
<ul style="list-style-type: none">• MP.1. Make sense of problems and persevere in solving them.• MP.2. Reason abstractly and quantitatively.• MP.3. Construct viable arguments and critique the reasoning of others.• MP.4. Model with mathematics.• MP.5. Use appropriate tools strategically.• MP.6. Attend to precision.• MP.7. Look for and make use of structure.• MP.8. Look for and express regularity in repeated reasoning.	
NJ: 2016 SLS: English Language Arts	
<ul style="list-style-type: none">• RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.• W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.• W.5.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.• W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)• SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.• SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.• L.5.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	
2020 SLS: Computer Science & Design Thinking	
NJSLS Performance Expectations (By the end of 5th Grade)	
<ul style="list-style-type: none">• 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.	

- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

NJSLS Performance Expectations (By the end of 5th Grade)

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence

- 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

Interdisciplinary/21st Century Connections

Science	<ul style="list-style-type: none"> • 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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Title	Shape and Coordinate Geometry
Unit Duration	4 Weeks
Unit Summary & Rationale	<p><i>Unit 5 involves patterns and plots in the first quadrant of the coordinate plane and the classification of two-dimensional figures as a hierarchy. By the end of Unit 5, students should master the following standards:</i></p> <p><i>5.NBT.5 – fluently multiply multi-digit whole numbers</i></p> <p><i>5.NBT.7 – add, subtract, multiply, and divide decimals to hundredths</i></p>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • What types of models, drawing or strategies are used to demonstrate the four operations as they relate to decimals? • Why is it important to be fluent in solving mathematical operations with multi-digit whole numbers? • How does the number line relate to the coordinate plane? • Why is the coordinate plane important in understanding real world math concepts? • How could you communicate the attributes of the coordinate plane? • When would you use the coordinate plane in a career? • How can you construct geometric figures in the first quadrant of a coordinate plane? • What types of data would best be shown on a line plot? • How can you find missing points in a geometric figure on a coordinate grid?

<p>Enduring Understandings</p>	<ul style="list-style-type: none"> • Kinesthetic learners find models extremely helpful in understanding math concepts; grids, fraction bars, pie charts, and number lines help students see the structure of the operations. • Multi-digit number operations are found in many careers and everyday life, and proficient knowledge of how to calculate them efficiently will help ensure a life-long skill. • Number line awareness helps student's perception as it relates to numbers on the • coordinate plane in Quadrant I. • Real world math problems including traveling from one point to another can be calculated on a coordinate plane. • Coordinate planes are utilized to represent data on a graph through ordered pairs. • Information on a graph or coordinate plane can be interpreted and analyzed in real life situations. • Knowing the geometric shapes and their attributes, students can then identify missing points on a graph.
<p>Learning Outcomes</p>	<ul style="list-style-type: none"> • Be able to add, subtract, multiply, and divide decimals to hundredths. • Be able to use a pair of perpendicular number lines, called axes, to define a coordinate system, with 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. • Be able to 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. • Be able to 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. • Be able to identify attributes of a two-dimensional shape and place them in categories.

- Be able to classify two- dimensional figures in a hierarchy based on properties.
- Be able to make a line plot to display a data set of measurements in fractions of a unit, and use operations to solve problems involving information presented in line plots.
- Be able to fluently multiply multi-digit whole numbers using the standard algorithm.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
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Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	

NJSLS	Activity
<p>5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<ul style="list-style-type: none"> • Use crayons to shade boxes on grid paper to represent decimals.
<p>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).</p> <p>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.</p> <p>5.G.B.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.</p>	<ul style="list-style-type: none"> • Play Hidden Treasure to find points on a coordinate grid. • Collect data using a Fahrenheit thermometer, water, ice cubes, and a stop watch. Organize data in a table. Graph the data on the coordinate grid. • Draw a Venn diagram to sort quadrilaterals and find out how they are related. • Play Polygon Capture, a memory game.

5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties.	
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.	<ul style="list-style-type: none"> • Use the strategy solve a simpler problem to help solve a problem with patterns.
5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.	<ul style="list-style-type: none"> • Construct a line plot on the board with post-its using data involving fractions.
5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.	<ul style="list-style-type: none"> • Play “I have...Who has...” to review multiplication facts. Use multiplication flash cards to line up and leave the classroom.

Mathematical Practices

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2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

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2020 SLS: Career Readiness, Life Literacies, and Key Skills

NJSLS Performance Expectations (By the end of 5th Grade)

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- Demonstrate creativity and innovation.
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- Model integrity, ethical leadership and effective management.

<p>reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.</p>	<ul style="list-style-type: none"> • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence
<ul style="list-style-type: none"> • 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process • 9.4.5.CT.2: Identify a problem and list the types of individuals and resources • 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global. 	
<p>Interdisciplinary/21st Century Connections</p>	
<p>Science</p>	<ul style="list-style-type: none"> • 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. • 5-PS1-3. Make observations and measurements to identify materials based on their properties. • 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.
<p>21st Century Connections</p>	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Accommodations & Modifications

Special Education Students, 504 students, English Language Learners, Students at-Risk Based on Students' Individual Needs

<p align="center">Time/General</p> <ul style="list-style-type: none"> • Allow extra time • Repeat and clarify directions • Provide breaks in between tasks • Have student verbalize directions • Provide timelines/due dates for reports and projects 	<p align="center">Processing</p> <ul style="list-style-type: none"> • Provide extra response time • Have student verbalize steps • Repeat directions • Provide small group instruction • Include partner work 	<p align="center">Comprehension</p> <ul style="list-style-type: none"> • Provide reading material on student's level • Have student underline important points • Assist student on how to use context clues to identify words/phrases • Ensure short manageable tasks
<p align="center">Tests/Quizzes/Grading</p> <ul style="list-style-type: none"> • Provide extended time • Provide study guides • Limit number of responses 	<p align="center">Behavior/Attention</p> <ul style="list-style-type: none"> • Establish classroom rules • Write a contract with the student specifying expected behaviors • Provide preferential seating • Re-focus student as needed • Reinforce student for staying on task 	<p align="center">Organization</p> <ul style="list-style-type: none"> • Monitor the student and provide reinforcement of directions • Verify the accurateness of homework assignments • Display a written agenda

ELL, Enrichment, Gifted & Talented Strategies

Accommodations Based on Students' Individual Needs

ELL Strategies

- Provide explicit, systematic instruction in vocabulary.

- Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement.
- Expose ELLs to rich language input.
- Scaffolding for ELLs language learning.
- Encourage continued L1 language development.
- Alphabet knowledge
- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
- Graphic organizers
- Modified texts
- Modified assessments
- Written/audio instruction
- Shorter paragraph/essay length
- Homogeneously grouped by level

Accommodations Based on Students' Individual Needs:

Enrichment Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers

- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum
- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions

Gifted & Talented Strategies

- More elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
- Development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
- Explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
- Encourage exposure to, selection, and use of appropriate and specialized resources.
- Promote self-initiated and self-directed learning and growth.
- Provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
- Flexible pacing
- Use of more advanced or complex concepts, abstractions, and materials

- Encourage students to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity.
- Questions that require a higher level of response and/or open-ended questions that stimulate inquiry, active exploration, and discovery.
- Encourage students to think about subjects in more abstract and complex ways
- Activity selection based on student interests, that encourage self-directed learning
- Group interaction and simulations
- Guided self-management
- Encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas.
- Engage students in active problem-finding and problem-solving activities and research.
- Provide students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.

