

Englewood on the Palisades Charter School

Mathematics Curriculum

Grade 5

Aligned With the 2023 New Jersey Student Learning Standards

The Vision for Mathematics Education in New Jersey

A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society. All students will have access to a high-quality mathematics education that fosters a population that:

- leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions.
- persists to make sense of and model problems arising in everyday life, society, and the workplace.
- thinks critically and strategically to assess quantitative relationships and to solutions to complex problems.
- employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers' reasoning.
- interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors.
- communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.

(NJ DOE, 2024)

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

Standard	Mathematically Proficient Students ...
1. Make sense of problems and persevere in solving them	start by explaining to themselves the meaning of a problem and looking for entry points to its solution. check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?”
2. Reason abstractly and quantitatively	make sense of quantities and their relationships in problem situations.
3. Construct viable arguments and critique the reasoning of others	understand and use stated assumptions, definitions, and previously established results in constructing arguments.
4. Model with mathematics	apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later.
5. Use appropriate tools strategically	are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations.
6. Attend to precision	try to communicate precisely to others.
7. Look for and make use of structure	look closely to discern a pattern or structure

8. Look for and express regularity in repeated reasoning	notice if calculations are repeated, and look both for general methods and for shortcuts.
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(NJ DOE, 2024)

New Jersey Legislative Statutes and Administrative Code Mathematics

Amistad Law: *N.J.S.A. 18A 52:16A-88*

[Radical Math](#): includes lessons on topics for social justice in mathematics
[African American Mathematician Bios](#)

Holocaust Law: *N.J.S.A. 18A:35-28*

<https://www.bbc.com/future/article/20191031-hilda-geiringer-mathematician-who-fled-the-nazis>

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

<https://prideinstem.org/>
[LGBTQA+ Mathematician Bios](#)
<https://www.ngpf.org/blog/math/math-monday-celebrating-disabled-mathematicians/>
[Mathematicians with Disabilities](#)

Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*

<http://www.ams.org/about-us/diversity>
<https://mathematicallygiftedandblack.com/>

Standards in Action: <i>Climate Change</i>
New Jersey became the first state in the nation to include climate change across content areas with the adoption of the 2020 New Jersey Student Learning Standards (NJSLS). The goal of inclusion of climate change education implementation is to foster generations of New Jersey students that can analyze, question, interpret, to think independently, and bring critical deduction to fulfill, and to lead in jobs created by burgeoning industries of the future green economy. Suggestions for how to incorporate climate change examples into math instruction will be noted in green text throughout the units.

Math Curriculum

Grade Five

This fifth grade math curriculum aligns with the 2023 New Jersey Student Learning Standards (NJSLS) and provides a solid foundation for learners. Instruction should be flexible and adaptable to meet the individual needs and learning styles of the students.

Instruction in grade five focuses broadly on three critical areas:

- developing accuracy and efficiency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions);
- extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing accuracy and efficiency with whole number and decimal operations; and
- developing understanding of volume.

Domains and Cluster Areas

- **Operations and Algebraic Thinking**
 - Write and interpret numerical expressions.
 - Analyze patterns and relationships.

- **Number and Operations in Base Ten**
 - Understand the place value system.
 - Perform operations with multi-digit whole numbers and with decimals to hundredths.
- **Number and Operations - Fractions**
 - Use equivalent fractions as a strategy to add and subtract fractions.
 - Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
- **Measurement**
 - Convert like measurement units within a given measurement system.
 - Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
- **Data Literacy**
 - Understand and analyze data visualizations.
 - Represent and interpret data.
- **Geometry**
 - Graph points on the coordinate plane to solve real-world and mathematical problems.
 - Classify two-dimensional figures into categories based on their properties.

Emphases are given at the cluster level. Refer to the New Jersey Student Learning Standards for Mathematics for the specific standards that fall within each cluster. Even though the clusters have different levels of emphasis, this does not mean that standards

can be omitted. All standards must be included in instruction throughout a grade level to ensure that students will be prepared for instruction at higher grade levels.

Indicator	Type	Cluster Heading
5.OA.A	A	Write and interpret numerical expressions
5.OA.B	A	Analyze patterns and relationships
5.NBT.A	M	Understand the place value system
5.NBT.B	M	Perform operations with multi-digit whole numbers and with decimals to hundredths
5.NF.A	M	Use equivalent fractions as a strategy to add and subtract fractions
5.NF.B	M	Apply and extend previous understandings of multiplication and division to multiply and divide fractions
5.M.A	S	Convert like measurement units within a given measurement system
5.M.B	M	Geometric Measurement: Understand concepts of volume and relate volume to multiplication and addition
5.DL.A	A	Understand and analyze data visualizations

5.DL.B	S	Represent and interpret data
5.G.A	A	Graph points on the coordinate plane to solve real-world and mathematical problems
5.G.B	A	Classify two-dimensional figures into categories based on their properties

Key: M — Major, S — Supporting Clusters, A — Additional Clusters

Required Fluencies in Grade 5:

- 5.NBT.B.5 Multiply multi-digit whole numbers using the standard algorithm

Grade 5 Units and Pacing	
Unit 1: Volume	3 weeks
Unit 2: Fractions as Quotients and Fraction Multiplication	4 weeks
Unit 3: Multiplying and Dividing Fractions	5 weeks
Unit 4: Multiplication and Division with Multi-Digit Numbers	5 weeks
Unit 5: Place Value Patterns and Decimal Operations	6 weeks
Unit 6: More Decimal and Fraction Operations	5 weeks
Unit 7: Shapes on the Coordinate Plane	3 weeks
Unit 8: Integrating Math Skills	4 weeks
Total Number of Weeks:	35 weeks

Unit 1: Volume

Unit Goal: Students find the volume of right rectangular prisms and solid figures composed of two right rectangular prisms.

Duration: 3 weeks

Essential Questions:

- How can we determine the volume of a right rectangular prism?
- What strategies can we use to find the volume of solid figures composed of two right rectangular prisms?
- How does understanding volume help us in real-world applications?
- What are the relationships between the dimensions of a right rectangular prism and its volume?
- How can we verify the accuracy of our volume calculations?

Enduring Understandings:

- Volume is a measure of the space occupied by a three-dimensional object and can be calculated by multiplying length, width, and height.
- The volume of a right rectangular prism can be found using a formula ($V = lwh$) where l is the length, w is the width, and h is the height.
- Solid figures composed of two right rectangular prisms can be broken down into separate prisms, and their volumes can be calculated individually and then added together.
- Understanding volume helps us solve problems related to packing, shipping, construction, and engineering.

Key NJSLS Strands:

- **5.M.B** Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition
 - **5.M.B.2** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
 - **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.
 - **5.M.B.2.b** 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.
 - **5.M.B.3** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
 - **5.M.B.4** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- **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.
- **5.M.B.4.b** Apply the formulas and 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.
- **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.
- **5.NBT.A** Understand the place value system
 - **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.
- **5.OA.A** Write and interpret numerical expressions
 - **5.OA.A.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Interdisciplinary Connections

- **SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- **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.5.6** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).
- **5-PS1-2** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

21st-Century Skills

- 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process.

Career Ready Practices

- **CRP 8** Utilize critical thinking to make sense of problems and persevere in solving problem solving problems.
- **CRP 11** Use technology to enhance productivity by accessing various online skill based websites.

Technology Integration

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively.
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Describe volume as the space taken up by a solid object.	What Is Volume?	Formative Assessments:	Materials:	area
Measure the volume of a rectangular prism by finding the number of unit cubes needed to fill it.	Measure Volume	Diagnostic Assessment	Connecting cubes	cubic unit
Use the layered structure in a rectangular prism to find volume.	Volumes of Prism Drawings	Mid-topic Checkpoint	Isometric Dot Paper Standard	rectangular prism
Find volume using	Use Layers to Determine Volume	Lesson Quizzes	Rectangular Prism Cards	unit cube
	Side Lengths of Rectangular Prisms	Lesson Self-assessment	Matching Prisms and Expressions	volume
	Expressions for Volume	Teacher Observations	Rulers (centimeters)	
	Cubic Units of Measure	Class Discussions	Rulers (inches)	
		Classwork/ Homework		
		Exit Slips/Google Form		

<i>length x width x height</i> or <i>area of the base x height</i>. Find the volume of a figure composed of rectangular prisms.	Volume of Solid Figures Figures Made of Prisms Measure Figures Made From Prisms Represent Volume with Expressions All Kinds of Prisms	Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Yardsticks Info Gap Volume Cards Tools for creating a visual display Activities: Volume Exploration With Real-World Objects Measurement Mania Prism Puzzle Challenge Layered Prism Investigation Missing Side Detective Expression Matching Game Cubic Unit Estimation Composite Figure Volume Quest	
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			Prism Identification and Volume Calculation Challenge Prism Measurement Mission Word Problem Volume Expressions Prism Properties Gallery Walk Mentor Texts: <i>Amanda Bean's Amazing Dream</i> by Cindy Neuschwander <i>How Tall, How Short, How Far Away</i> by David A. Adler	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson

	• Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) • Intensive instruction • Practice fact retrieval • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability

	Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers

	Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.

Unit 2: Fractions as Quotients and Fraction Multiplication

Unit Goal: Students develop an understanding of fractions as the division of the numerator by the denominator, that is $a \div b = a/b$,

and solve problems that involve the multiplication of a whole number and a fraction, including fractions greater than 1.

Duration: 4 weeks

Essential Questions:

- What is a fraction, and how is it related to division?
- How can we interpret fractions as part of a whole or as division problems?
- How do we multiply a whole number by a fraction, and what does the result represent?
- How can we apply the concept of multiplying whole numbers by fractions to solve real-world problems?
- What strategies can we use to multiply fractions greater than 1 by whole numbers?

Enduring Understandings:

- Fractions represent parts of a whole or division problems, with the numerator indicating the number of parts and the denominator indicating the size of each part.
- The multiplication of a whole number by a fraction can be interpreted as repeated addition or as finding a fraction of the whole number.
- When multiplying a whole number by a fraction, the result is a fraction representing a portion of the whole number.
- Real-world problems involving multiplication of whole numbers and fractions can be solved by applying the concept of finding fractional parts of quantities.
- Multiplying fractions greater than 1 by whole numbers results in products greater than the original whole number, demonstrating the concept of scaling.
- Understanding fractions as division helps clarify their meaning and facilitates problem-solving involving fractions and whole numbers.

Key NJSLS Strands:

- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.3** Interpret a fraction as division of the numerator by the denominator. 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. *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.*
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- **5.NF.B.a** Interpret the product $\frac{a}{b} \times \frac{c}{d}$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations.
- **5.NF.B.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.
- **5.OA.A** Write and interpret numerical expressions
 - **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.

Interdisciplinary Connections

- **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.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- **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.
- **NJSLSA.SL2** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **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.

21st-Century Skills

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

Career Ready Practices
● CRP 4 Communicate clearly and effectively and with reason. ● CRP 8 Utilize critical thinking to make sense of problems and persevere in solving independent practice and problem solving problems. ● CRP 11 Use technology to enhance productivity.
Technology Integration
● TECH.8.1.2 All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. ● TECH.8.1.2.A.CS2 Select and use applications effectively and productively. ● TECH.8.2.2.C The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Represent and explain the relationship between division and fractions. Solve problems involving division of whole numbers leading to answers that are fractions. Connect division to multiplication of a whole number by a	Share Sandwiches Share More Sandwiches Interpret Equations Division Situations Relate Division and Fractions Relate Division and Multiplication Divide to Multiply Unit	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions	Materials: Grid Paper Diagrams and Expressions Cards Colored paper Glue Rulers Scissors Activities:	area cubic unit rectangular prism unit cube volume

non-unit fraction. Connect division to multiplication of a whole number by a unit fraction. Explore the relationship between multiplication and division. Find the area of a rectangle when one side length is a whole number and the other side length is a fraction or mixed number. Represent and solve problems involving the multiplication of a whole number by a fraction or mixed number. Write, interpret, and evaluate numerical expressions that represent multiplication of a whole number by a fraction or mixed number.	Fractions Divide to Multiply Non-unit Fractions Relate Area to Multiplication Fractional Side Lengths Less Than 1 Fractional Side Lengths Greater Than 1 Decompose Area Area and Properties of Operations Area Situations Multiply More Fractions Estimate Products Mosaic Pictures	Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Equal Sharing Sandwiches Fractional Sandwich Creations Equation Exploration Division Word Problems Fraction Division Connection Multiplication and Division Facts Unit Fraction Multiplication Non-unit Fraction Multiplication Area Multiplication Exploration Fractional Side Lengths Exploration Fractional Side Lengths Investigation Area Decomposition Challenge	
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			Distributive Property Area Models Real-world Area Scenarios Advanced Fraction Multiplication Estimating Fraction Products Mosaic Fraction Art Mentor Texts: <i>Polar Bear Math: Learning About Fractions with Klondike and Snow</i> by Ann Whitehead Nagda and Cindy Bickel <i>Working with Fractions</i> by David A. Adler <i>Go, Fractions!</i> by Judith Stamper <i>Parting is Such Sweet Sorrow: Fractions and Decimals (Adventures in Mathopolis)</i> by Linda Powley and Catherine Weiskopf	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition

	Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase

	Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations

	Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.
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Unit 3: Multiplying and Dividing Fractions

Unit Goal: Students extend multiplication and division of whole numbers to multiply fractions by fractions and divide a whole number and a unit fraction.
Duration: 5 weeks
Essential Questions: • How does multiplying fractions by fractions extend our understanding of multiplication? • What strategies can we use to multiply fractions by fractions efficiently? • How does dividing a whole number by a unit fraction differ from dividing by a whole number? • In what real-world situations do we encounter multiplication and division of fractions? • How do multiplication and division of fractions relate to each other and to multiplication and division of whole numbers?
Enduring Understandings: • Multiplying fractions by fractions extends our understanding of multiplication to include situations where parts of wholes are being combined. • Strategies such as using area models, finding common denominators, and simplifying fractions can help us multiply fractions by fractions efficiently. • Dividing a whole number by a unit fraction involves partitioning the whole number into equal parts determined by the denominator of the unit fraction. • Real-world situations involving multiplication and division of fractions include recipes, measurements, and proportions in

cooking, construction, and other practical contexts.

- Multiplication and division of fractions are inverse operations, and understanding one operation helps us understand the other. Additionally, the principles of multiplication and division of whole numbers apply to fractions, with appropriate adjustments for the fractional context.

Key NJSLS Strands:

- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - **5.NF.B.a** Interpret the product as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations.
 - **5.NF.B.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.
 - **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.7.a** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
 - **5.NF.B.7.b** Interpret division of a whole number by a unit fraction, and compute such quotients.
 - **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. **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.

Interdisciplinary Connections

- **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.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- **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.
- **NJSLSA.SL2** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **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 Skills

- **9.1.5.FP.5** Illustrate how inaccurate information is disseminated through various external influencers including the media, advertisers/marketers, friends, educators, and family members.

Career Ready Practices

- **CRP 4** Communicate clearly and effectively and with reason during the activities of the lesson.
- **CRP 8** Utilize critical thinking to make sense of problems and persevere in solving independent practice and problem solving problems.
- **CRP 11** Use technology to enhance productivity.

Technology Integration

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Recognize that $a/b \times c/d = a \times c/b \times d$ and use this generalization to multiply fractions numerically. Represent and describe multiplication of a fraction by a fraction using area concepts. Divide a unit fraction by a whole number using whole-number division concepts. Divide a whole number by a unit fraction using whole-number division concepts. Solve problems involving fraction multiplication and division.	One Piece of One Part Represent Unit Fraction Multiplication Multiply Unit Fractions Situations about Multiplying Fractions Multiply a Unit Fraction by a Non-unit Fraction Multiply Fractions Generalize Fraction Multiplication Apply Fraction Multiplication My Own Flag Concepts of Fraction Division Divide Unit Fractions by Whole Numbers Represent Division of Unit Fractions by Whole Numbers Divide Whole Numbers	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Colored pencils or crayons Paper Rulers Tools for creating a visual display Construction paper Fraction Division Problem Sort Tiles Activities: One Piece, One Part Puzzle Visualizing Unit Fraction Multiplication Unit Fraction Mastery Mission Fractional Multiplication Adventures	area cubic unit rectangular prism unit cube volume

	by Unit Fractions Represent Division of Whole Numbers by Unit Fractions Fraction Division Situations Reason About Quotients Problem Solving with Fractions Fraction Multiplication and Division Situations Represent Situations with Multiplication and Division Fraction Games How Much in the Group?	Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Mixing Fractions: Unit meets Non-unit Fraction Multiplication Mania Discovering Patterns in Fraction Multiplication Fraction Multiplication Challenges Flag Fractions Design Challenge Fraction Division Concepts Quest Dividing Units and Whole Numbers Expedition Visualizing Division: Unit Fractions Edition Whole Number Division by Unit Fractions Adventure Fraction Division Representation Challenge	
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			Solving Fraction Division Situations Understanding Quotients: Fraction Division Fraction Problem Solving Expedition Fraction Multiplication and Division Dilemmas Visualizing Fraction Operations Fractional Fun Games Group Division Challenges with Fractions Mentor Texts: <i>Sir Cumference and the Fraction Faire</i> by Cindy Neuschwander <i>Fractions in Disguise: A Math Adventure</i> by Edward Einhorn <i>The Hershey's Milk Chocolate Bar Fractions Book</i> by Jerry	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPS and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group

	Solidify and refine concepts through repetition Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u>

	Work toward longer passages as skills in English increase Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities

	Provide whole group enrichment explorations Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.
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Unit 4: Multiplication and Division with Multi-Digit Numbers

Unit Goal: Students use the standard algorithm to multiply multi-digit whole numbers. They divide whole numbers up to four-digits by two-digits divisors using strategies based on place value and properties of operations.
Duration: 5 weeks
Essential Questions: • How does the standard algorithm for multiplication help us efficiently multiply multi-digit whole numbers? • What strategies can we use to divide whole numbers by two-digit divisors, and how do they relate to place value and properties of operations? • Why is understanding place value important when performing multiplication and division operations with multi-digit numbers? • What are the steps involved in the standard algorithm for multiplication, and how do they connect to the properties of multiplication? • How can we check the accuracy of our multiplication and division calculations?
Enduring Understandings: • The standard algorithm for multiplication provides a systematic method for efficiently multiplying multi-digit whole numbers by breaking down the process into smaller, manageable steps. • Strategies for division of whole numbers by two-digit divisors, such as partial quotients or long division, rely on

understanding place value and the relationship between multiplication and division.

- Place value is crucial in multiplication and division as it helps us understand the meaning of digits in different positions and enables us to perform operations accurately.
- The standard algorithm for multiplication involves multiplying each digit of one number by each digit of the other number, aligning the partial products based on place value, and adding them together to find the final product.
- Checking the accuracy of multiplication and division calculations involves verifying the reasonableness of the results, estimating the answer beforehand, and using inverse operations to confirm the solution.

Key NJSLS Strands:

- **5.NBT.B** Perform operations with multi-digit whole numbers & with decimals to hundredths
 - **5.NBT.B.5** With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.
 - **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.
- **5.OA.A** Write and interpret numerical expressions
 - **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.
- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.3** Interpret a fraction as division of the numerator by the denominator. 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. *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.*
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - **5.NF.B.a** Interpret the product $a \times \frac{b}{c}$ as a parts of a partition of $\frac{b}{c}$ into b equal parts; equivalently, as the result of a sequence of operations.
 - **5.NF.B.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.

- **5.M.B** Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition
 - **5.M.B.2** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
 - **5.M.B.4** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

Interdisciplinary Connections

- **L.5.6** Acquire and use accurately grade-appropriate general academic and domain specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).
- **L.5.4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
- **NJSLSA.L4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
- **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.

21st-Century Skills

- **9.1.5.FP.3** Analyze how spending choices and decision-making can result in positive or negative consequences.

Career Ready Practices

- **CRP 4** Communicate clearly and effectively and with reason.
- **CRP 11** Use technology to enhance productivity.

Technology Integration

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively.
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Multiply multi-digit whole numbers using the standard algorithm Divide multi-digit whole numbers using strategies based on place value, properties of operations, and the relationship between multiplication and division. Multiply and divide to solve real-world and mathematical problems involving area and volume.	Multi-digit Multiplication Using the Standard Algorithm Estimate and Find Products Partial Products in Diagrams Partial Products in Algorithms Standard Algorithm: One-digit and Multi-digit Numbers with Composing Standard Algorithm: Multi-digit Numbers without Composing Standard Algorithm: Multi-digit Numbers with Composing Build Multiplication Fluency	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests	Materials: Partial Product Expressions Greatest Product Number Cards Partial Quotient Expressions Meter Sticks Activities: Mastering Multi-digit Multiplication Estimate and Calculate: Multi-digit Multiplication Visualizing Partial Products Partial Products Breakdown	algorithm partial product product quotient compose

	Multiplication Fluency Multi-digit Division Using Partial Quotients Different Partial Quotients An Algorithm Using Partial Quotients Divide Using Partial Quotients Practice an Algorithm Using Partial Quotients Find Missing Side Lengths Fractions as Partial Quotients (optional) Let's Put it to Work	Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Composing for Multiplication Mastery Algorithmic Excellence: No Composing Needed Composing Challenge: Multi-digit Multiplication Fluency Builders: Multiplication Madness Fluent Multiplication Masters Division with Partial Quotients Introduction Dancing Division: Real-world Application Exploring Different Quotients Creating Our Division Algorithm Practicing with Partial Quotients Mastery through Practice: Division with Partial Quotients	
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			The Birds Multiplication Migration Lots of Milk Multiplication Madness World's Record Noodle Soup Division Challenge Trash Talk Multiplication Scavenger Hunt Shipping Trash Division Dilemma Food Waste Journal Division Diary Mentor Texts: <i>The Multiplying Menace</i> by Pam Calvert <i>Mathematics:</i> <i>Multiplication</i> by David A. Adler <i>Division Unplugged</i> by David C. Anchin	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated

	Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals

	Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills

	Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.
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(NJDOE, 2024)

Unit 5: Place Value Patterns and Decimal Operations

Unit Goal: Students build from place value understanding in grade 4 to 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 $\frac{1}{10}$ of what it represents in the place to its left. They use this place value understanding to round, compare, order, add, subtract, multiply, and divide decimals.

Duration: 6 weeks

Essential Questions:

- How does understanding the relationship between place values in a multi-digit number help us perform operations with decimals?
- Why is it important to recognize that each digit in a multi-digit number represents a different value based on its position?
- How does rounding decimals rely on our understanding of place value and the relative magnitude of digits?
- In what ways can place value understanding be applied when comparing and ordering decimals?
- How does place value understanding influence the strategies we use for adding, subtracting, multiplying, and dividing decimals?

Enduring Understandings:

- Each digit's position in a multi-digit number determines its value, with each place representing a power of 10. This understanding forms the foundation for performing operations with decimals.
- Recognizing that a digit in one place represents 10 times the value of the same digit in the place to its right, and $\frac{1}{10}$ of the value in the place to its left, helps us make sense of the relative sizes of decimals.
- Rounding decimals involves considering the place value of digits to determine the appropriate rounding digit and

understanding the impact of rounding on the overall value of a number.

- When comparing and ordering decimals, we rely on our understanding of place value to identify the significance of each digit and determine the relationships between numbers.
- Applying place value understanding enables us to develop efficient strategies for performing operations with decimals, including aligning decimal points, regrouping, and interpreting the results in context.

Key NJSLS Strands:

- **5.NBT.A** Understand the place value system
 - **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 of what it represents in the place to its left.
 - **5.NBT.A.3** Read, write, and compare decimals to thousandths.
 - **5.NBT.A.3.a** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.
 - **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.
 - **5.NBT.A.4** Use place value understanding to round decimals to any place.
- **5.NBT.B** Perform operations with multi-digit whole numbers & with decimals to hundredths
 - **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.
- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - **5.NF.B.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

Interdisciplinary Connections

- **NJSLSA.L4.** Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

- **L.5.6** Acquire and use accurately grade-appropriate general academic and domain specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).
- **L.5.4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
- **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 Skills

- **9.2.5.CAP.6** Compare the characteristics of a successful entrepreneur with the traits of successful employees.

Career Ready Practices

- **CRP 4** Communicate clearly and effectively and with reason while working in groups.
- **CRP 11** Use technology to enhance productivity.

Technology Integration

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Compare, round and order decimals through the thousandths place based on the value of the digits in each place. Read, write, and	Numbers to Thousandths: What is One Thousandth? Thousandths on Grids and in Words	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint	Materials: Chart paper Colored pencils, crayons, or markers	decimal decimal point whole number tenths

represent decimals to the thousandths place, including in expanded form. Add and subtract decimals to the hundredths using strategies based on place value. Multiply decimals with products resulting in the hundredths using place value reasoning and properties of operations. Divide decimals with quotients resulting in the hundredths using place value reasoning and properties of operations.	Thousandths in Expanded Form Explore Place Value Relationships Compare Decimals Compare Decimals on the Number Line Round Decimals Order Decimals Solve Problems with Decimals Make Sense of Decimal Addition Estimate and Add Analyze Addition Mistakes Make Sense of Decimal Subtraction Estimate and Subtract Addition and Subtraction Multiply Decimals and	Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Number cubes Decimal Multiplication Expression Cards Small Grids Activities: Decimal Decisions Rounding Rally Decimal Dominoes Decimal Dilemmas Adding Decimals Detectives Estimate and Add Adventure Addition Analysis Subtraction Sense Estimate and Subtract Safari Addition and Subtraction Shenanigans Decimal Multiplication Mastery	hundredths thousandths place value pattern expanded form rounding
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	Whole Numbers Use Whole Number Facts Use Properties to Multiply Decimals Products in the Hundredths Place Multiply More Decimals Divide Decimals Divide Whole Numbers by 0.1 and 0.01 Divide Whole Numbers by Decimals Divide Decimals by Whole Numbers Divide Decimals by Decimals		Whole Number Wonders Properties of Decimal Products Hundredths Place Heroes Multiplying More Decimals Decimal Division Divulgence Dividing by Tenths and Hundredths Dividing with Decimals Decimal Divisions Delight Mentor Texts: <i>If You Made a Million</i> by David M. Schwartz <i>Marvelous Math: A Book of Poems</i> by Lee Bennett Hopkins <i>Full House: An Invitation to Fractions</i> by Dayle Ann Dodds	
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			<i>Math Curse</i> by Jon Scieszka and Lane Smith <i>Sir Cumference and All the King's Tens</i> by Cindy Neuschwander <i>The Best of Times</i> by Greg Tang	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts

Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work.
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	Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.

Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.
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Unit 6: More Decimal and Fraction Operations

Unit Goal: Students solve multi-step problems involving measurement conversions, line plots, and fraction operations, including addition and subtraction of fractions with unlike denominators. They also explain patterns when multiplying and dividing by powers of 10 and interpret multiplication as scaling by comparing products with factors.
Duration: 5 weeks
Essential Questions: • How can we solve multi-step problems that involve measurement conversions, line plots, and fraction operations? • What strategies can we use to add and subtract fractions with unlike denominators, and how do we decide which strategy to apply in a given situation?

- Why is it important to recognize patterns when multiplying and dividing by powers of 10, and how can we use these patterns to simplify calculations?
- In what ways can we interpret multiplication as scaling, and how does comparing products with factors help us understand this concept?
- How do measurement conversions, line plots, and fraction operations relate to real-world situations, and why is it important to be able to solve problems involving these concepts?

Enduring Understandings:

- Solving multi-step problems involving measurement conversions, line plots, and fraction operations requires applying a combination of mathematical skills and strategies, such as identifying relevant information, choosing appropriate operations, and interpreting results in context.
- Adding and subtracting fractions with unlike denominators involves finding a common denominator and applying equivalent fractions to ensure accurate results. Understanding different strategies for finding a common denominator enables efficient problem-solving.
- Recognizing patterns when multiplying and dividing by powers of 10 facilitates mental computation and simplifies calculations. Understanding how the placement of digits shifts when multiplying or dividing by powers of 10 helps in predicting and interpreting results.
- Interpreting multiplication as scaling involves understanding that multiplying by a number greater than 1 results in a larger product, while multiplying by a fraction or decimal less than 1 results in a smaller product. Comparing products with factors provides insight into the relationship between the factors and the resulting product.
- Measurement conversions, line plots, and fraction operations are essential mathematical skills with practical applications in various real-world contexts, such as cooking, construction, and data analysis. Being able to solve problems involving these concepts enhances students' ability to analyze and solve real-world problems accurately and efficiently.

Key NJSL Strands:

- **5.M.A** Convert like measurement units within a given measurement system
 - **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.
- **5.DL.B** Represent and interpret data
 - **5.DL.B.5** 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. 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.

- **5.NBT.A** Understand the place value system
 - **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 of what it represents in the place to its left.
 - **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.
- **5.NF.A** Use equivalent fractions as a strategy to add and subtract fractions
 - **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.
 - **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.
- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - **5.NF.B.4.a** Interpret the product $a \times \frac{b}{c}$ as a parts of a partition of $\frac{b}{c}$ into c equal parts; equivalently, as the result of a sequence of operations.
 - **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.
 - **5.NF.B.5** Interpret multiplication as scaling (resizing), by:
 - **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.
 - **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 to the effect of multiplying by 1.
- **5.OA.A** Write and interpret numerical expressions.

Interdisciplinary Connections
● SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. ● 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.5.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition). ● 5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
21st-Century Skills
● 9.1.5.FP.3 Analyze how spending choices and decision-making can result in positive or negative consequences. ● 9.1.5.FP.4 Explain the role of spending money and how it affects wellbeing and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).
Career Ready Practices
● CRP 8 Utilize critical thinking to make sense of problems and persevere in solving problem solving problems. ● CRP 11 Use technology to enhance productivity by accessing various online skill based websites.
Technology Integration
● TECH.8.1.2 All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. ● TECH.8.1.2.A.CS2 Select and use applications effectively and productively ● TECH.8.2.2.C The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Explain patterns when multiplying and dividing by powers of 10. Solve multi-step problems involving measurement conversions. Add and subtract fractions with unlike denominators. Create line plots to display fractional measurement data, and use the information to solve problems. Solve problems involving addition and subtraction of fractions. Interpret multiplication as scaling (resizing). Make generalizations about multiplying a whole number by a fraction greater than, less than and equal to 1.	Measurement Conversions and Powers of 10 Place Value Patterns Powers of 10 Metric Conversion and Multiplication by Powers of Ten Metric Conversion and Division by Powers of Ten Multi-step Conversion Problems: Metric Length Multi-step Conversion Problems: Metric Liquid Volume Multi-step Conversion Problems: Customary Length Add and Subtract Fractions with Unlike Denominators	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Meter Sticks Yardsticks Customary Measurement Card Sort Fraction Add and Subtract Sorting Cards Paper clips Pencils Tools for creating a visual display Activities: Metric Conversion Marathon Place Value Puzzlers Exponential Explorations Metric Magic Metric Maze	conversion dimension conversion factor: line plot data point scale fraction operations fraction numerator denominator common denominator least common denominator (LCD) regrouping exponential notation multiplicative pattern scale factor scaling

	Add and Subtract Fractions Use Equivalent Expressions All Sorts of Denominators Different Ways to Subtract Solve Problems Put It All Together: Add and Subtract Fractions Representing Fractions on a Line Plot Problem Solving with Line Plots Compare Products Interpret Diagrams Compare Without Multiplying Compare to 1	Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Metric Length Challenge Metric Liquid Volume Quest Customary Length Adventure Fraction Fusion Fraction Fiesta Equivalent Equation Exploration Denominator Detective Subtraction Strategies Showcase Fraction Problem Solving Scenarios Add and Subtract Fractions Challenge Fraction Line Plot Creations Line Plot Problem Puzzles	proportional relationship enlargement
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			Product Comparison Challenge Diagram Interpretation Dilemmas Comparative Computation Conundrum One Comparison Quest Mentor Texts: <i>One Grain of Rice: A Mathematical Folktale</i> by Demi <i>How Much Is a Million?</i> by David M. Schwartz <i>The Best of Times</i> by Greg Tang <i>Alexander, Who Used to Be Rich Last Sunday</i> by Judith Viorst <i>Sir Cumference and the Off-the-Charts Dessert</i> by Cindy Neuschwander <i>How Many Jelly Beans?</i> by Andrea Menotti	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated

	Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals

	Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills

	Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.
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(NJDOE, 2024)

Unit 7: Shapes on the Coordinate Plane

Unit Goal: Students plot coordinate pairs on a coordinate grid and classify triangles and quadrilaterals in a hierarchy based on properties of side length and angle measure. They generate, identify, and graph relationships between corresponding terms in two numeric patterns, given two rules, and represent and interpret real world and mathematical problems on a coordinate grid.

Duration: 3 weeks

Essential Questions:

- How can we use coordinate pairs to plot points on a coordinate grid?
- What properties define triangles and quadrilaterals, and how do we classify them based on these properties?
- How do we identify and graph relationships between corresponding terms in numeric patterns with given rules?
- What are some real-world scenarios that can be represented and interpreted using a coordinate grid?
- How do coordinate grids help us visualize and analyze mathematical relationships and problems?

Enduring Understandings:

- Plotting coordinate pairs on a coordinate grid enables us to represent and analyze the relationships between points in a two-dimensional space.
- Triangles and quadrilaterals can be classified based on their side lengths and angle measures, allowing us to organize them into a hierarchical system based on their properties.
- By generating and identifying relationships between corresponding terms in numeric patterns with given rules, we develop an understanding of mathematical structures and patterns.
- Representing real-world scenarios on a coordinate grid allows us to visualize and solve mathematical problems in context,

enhancing our problem-solving skills and understanding of mathematical concepts.

- The coordinate grid serves as a powerful tool for visualizing mathematical relationships, analyzing data, and solving problems across various mathematical domains, including geometry, algebra, and data analysis.

Key NJSLS Strands:

- **5.G.A** Graph points on the coordinate plane to solve real-world and mathematical problems
 - **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).
 - **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.*
- **5.G.B** Classify two-dimensional figures into categories based on their properties
 - **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.
 - **5.G.B.4** Classify two-dimensional figures in a hierarchy based on properties.
- **5.OA.A** Write and interpret numerical expressions
 - **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.
- **5.OA.B** Analyze patterns and relationships
 - **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.
- **5.NBT.B** Perform operations with multi-digit whole numbers & with decimals to hundredths

- **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.

Interdisciplinary Connections

- **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.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- **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.
- **3-5-ETS1-3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

21st-Century Skills

- **9.2.5.A.1** Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

Career Ready Practices

- **CRP 8** Utilize critical thinking to make sense of problems and persevere in solving problem solving problems.
- **CRP 11** Use technology to enhance productivity by accessing various online skill based websites.

Technology Integration

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively.
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Locate points on a coordinate grid. Classify triangles and quadrilaterals in a hierarchy based on angle measurements and side lengths. Generate, identify, and graph relationships between corresponding terms in two patterns, given a rule. Represent and interpret real world and mathematical problems on a coordinate grid.	Explore the Coordinate Grid Points on the Coordinate Grid Plot More Points Sort Quadrilaterals Trapezoids Hierarchy of Quadrilaterals Rectangles and Squares Sort Triangles Numerical Patterns Generate Patterns Interpret Relationships Patterns and Ordered Pairs Represent Problems on the Coordinate Grid Perimeter and Area of	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Dry erase markers Sheet protectors Card Sort Quadrilaterals Materials from a previous lesson Toothpicks Quadrilateral Clues Card Sort Triangles Coins Activities: Grid Discovery Quest Plotting Point Parade Point Plotting Palooza Quadrilateral Sorting Challenge Trapezoidal Treasures Hunt	plotting coordinate pairs coordinate grid relationships two-dimensional space triangles quadrilaterals classification side lengths angle measures properties numeric patterns visualization

	Rectangles	Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Quadrilateral Hierarchy Puzzle Rectangular Realm Exploration Triangular Classifying Adventure Numerical Pattern Puzzle Expedition Pattern Creation Odyssey Relationship Riddle Quest Patterned Pairs Discovery Grid Problem-solving Quest Rectangular Measurement Challenge Mentor Texts: <i>Mummy Math: An Adventure in Geometry</i> by Cindy Neuschwander	
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			<i>The Shapes We Eat</i> by Simone T. Ribke <i>Triangle</i> by Mac Barnett and Jon Klassen <i>A Remainder of One</i> by Elinor J. Pinczes <i>The Great Pet Sale</i> by Mick Inkpen <i>The Lemonade War</i> by Jacqueline Davies <i>Flat Stanley's Worldwide Adventures</i> by Jeff Brown <i>How Much Is a Million?</i> by David M. Schwartz	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach

	Small group or Individual instruction (Tier III) • Intensive instruction • Practice fact retrieval • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed

	Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including

	Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes. As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.

(NJDOE, 2024)

Unit 8: Integrating Math

Unit Goal: Students consolidate and solidify their understanding of various concepts and skills related to major work of the grade. They also continue to work toward fluency goals of the grade.

Duration: 4 weeks

Essential Questions:

- How can we use place value strategies and properties of operations to effectively divide multi-digit whole numbers?
- Why is fluency in multiplying multi-digit whole numbers important, and how does the standard algorithm facilitate this fluency?
- What strategies and tools can we use to solve multi-step problems involving volume effectively?

Enduring Understandings:

- Division of multi-digit whole numbers involves understanding the place value of digits and applying properties of operations to efficiently divide large numbers into smaller parts.
- Fluently multiplying multi-digit whole numbers using the standard algorithm requires mastery of place value concepts and procedural skills, enabling efficient and accurate calculations.
- Solving multi-step problems involving volume requires identifying relevant information, applying appropriate mathematical operations, and interpreting the results in context to find solutions effectively.

Key NJSL Strands:

- **5.NBT.B** Perform operations with multi-digit whole numbers & with decimals to hundredths
 - **5..NBT.B.5** With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.
 - **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.
 - **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.
- **5.G.B** Classify two-dimensional figures into categories based on their properties
 - **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.
 - **5.G.B.4** Classify two-dimensional figures in a hierarchy based on properties.

- **5.M.B** Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition
 - **5.M.B.2** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
 - **5.M.B.4** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
- **5.NF.A** Use equivalent fractions as a strategy to add and subtract fractions
 - **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.
- **5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - **5.NF.B.3** Interpret a fraction as division of the numerator by the denominator. 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. *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.*
 - **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- **5.OA.A** Write and interpret numerical expressions

Interdisciplinary Connections

- **L.5.6** Acquire and use accurately grade-appropriate general academic and domain specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).
- **L.5.3** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **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.
- **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 Skills

● 9.2.5.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
Career Ready Practices
● CRP 4 Communicate clearly and effectively and with reason. ● CRP 8 Utilize critical thinking to make sense of problems and persevere in solving independent practice and problem solving problems. ● CRP 11 Use technology to enhance productivity.
Technology Integration
● TECH.8.1.2 All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. ● TECH.8.1.2.A.CS2 Select and use applications effectively and productively. ● TECH.8.2.2.C The design process is a systematic approach to solving problems.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Divide multi-digit whole numbers using place value strategies and the properties of operations. Fluently multiply multi-digit whole numbers using the standard algorithm. Solve multi-step problems involving	Multiply and Divide Whole Numbers Find the Largest Product More Multiplication Factors as a Factor in Our Strategy Choice Dive Back Into Division More Division	Formative Assessments: Diagnostic Assessment Mid-topic Checkpoint Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions	Materials: Rulers Yardsticks Paper clips Tools for creating a visual display Number cubes Activities:	area axes coordinate grid coordinates cubic unit horizontal axis power of 10

volume.	Apply Volume Concepts Revisit Volume Estimating Volume Problem Solving with Volume: Water Fraction and Decimal Operations Here Comes the Sum What's the Difference? Review Decimals Day Review Multiplying Fractions Estimation Exploration	Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Math Olympics Product Scavenger Hunt Multiplication Relay Race Factors as a Factor in Our Strategy Choice: Factor FlurryDivision Bingo Division Challenge Cards Volume Builders Volume Gallery Walk Estimating Volume: Volume Estimation Stations Water Works Project Fraction and Decimal Operations: Fraction and Decimal Relay Sum Search Difference Detectives	rectangular prism right triangle unit cube vertical axis volume
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			Review Decimals Day: Decimal Jeopardy Fraction Frenzy Estimation Fair Estimating the Volume of the World's Largest Wagon Filling up the World's Largest Wagon Decimal Game Day Multiply Fractions Game Day True or False? Which One Doesn't Belong? Mentor Texts: <i>How Many Seeds in a Pumpkin?</i> by Margaret McNamara	
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			<i>The Best of Times</i> by Greg Tang <i>A Remainder of One</i> by Elinor J. Pinczes <i>Spaghetti and Meatballs for All!</i> by Marilyn Burns <i>The Best Bug Parade</i> by Stuart J. Murphy	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated

	● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	<u>Universal Design for Learning and Access for Students with Disabilities</u> <u>Movematics (dyscalculia.org)</u> Follow all the IEP/504 plan modifications Allow extra time to complete assignments or tests Guided notes and/or scaffold outline for written assignments Work in a small group Solidify and refine concepts through repetition Allow answers to be given orally or dictated Use multi-sensory teaching approaches Utilize assistive technology and materials Use large print books, Braille, or books on CD (digital text) Text to speech/audio recorded selections Amplification system as needed Leveled texts according to ability Fine motor skill stations embedded in rotation as needed Modified or constrained spelling word lists Provide anchor charts with high frequency words and phonemic patterns

	Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	<u>Mathematical Language Development and Access for English Learners</u> Work toward longer passages as skills in English increase Use visuals Introduce/highlight key vocabulary before lesson Teacher models reading aloud daily Provide peer tutoring Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers Guided notes and/or scaffold outline for written assignments Provide students with English Learner leveled readers Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts Create a visual display of what students want to do or make with the connecting cubes.

	As students share ideas, include a drawing or annotation to illustrate connections. Invite students to use gestures as they count.
Accelerating Students	<u>Accelerating Students Guide</u> Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) Provide options, alternatives and choices to differentiate and broaden the curriculum Organize and offer flexible small group learning activities Provide whole group enrichment explorations Teach cognitive and methodological skills Use center, stations, or contracts Organize integrated problem-solving simulations Propose interest-based extension activities Expose students to beyond level texts.

(NJDOE, 2024)

Prepared by Julie Lang, MA

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