**Subject**

**Elementary- 3rd Grade Mathematics**

**Curriculum Guide**

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**LINDEN PUBLIC SCHOOLS**

**LINDEN, NEW JERSEY**

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**The Linden Board of Education adopted the Curriculum Guide on:**

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| **July 28, 2022** |  | **Education Report #22** |
| **Date** |  | **Agenda Item** |
|  | | |
| **Rationale** | | |

**EDUCATION EQUITY:** The Linden Public School District guarantees each student equal educational opportunity regardless of age, race, color, creed, religion, gender, language, affectional or sexual orientation, ancestry, national origin, marital or economic status. For Information, contact District Educational Equity Officer Kevin Thurston at **(**908) 486-2800 x 8307**.**

**NONDISCRIMATION:** The Linden Public School District does not discriminate against handicapped persons in admission or access to or treatment or employment in its programs, activities, and vocational opportunities. For information contact District Public 504 Officer Annabell Louis at (908) 486-2800 x 8025.

**Linden Public Schools Vision**

The Linden Public School District is committed to developing respect for diversity, excellence in education, and a commitment to service, in order to promote global citizenship and ensure personal success for all students

**Linden Public Schools Mission**

The mission of the Linden Public School District is to promote distinction through the infinite resource that is Linden’s diversity, combined with our profound commitment to instructional excellence, so that each and every student achieves their maximum potential in an engaging, inspiring, and challenging learning environment.

**Math Department Vision**

To equip students with the understanding and application of mathematical skills and processes to foster a drive for advanced mathematics and higher-level thinking.

**Math Department Mission Statement**

To develop a community of learners who construct and communicate meaning from the mathematical world around them. Students will experience mathematics that encourage them to think critically, discover and apply concepts to solve problems strategically. Students will be encouraged to solve equations with accuracy, efficiency, and flexibility. Furthermore, students will have a multitude of opportunities to apply mathematical tools and practice standards to solve real-world and multi-step problems.

**Math Department Goals**

* Provide opportunities for student to develop computation skills, conceptual understanding, and problem-solving skills
* Require students to explain, justify or prove their thinking through mathematical reasoning, modeling, and speaking

Course Description

The third-grade mathematics program focuses on the development of understanding multiplication and division, fractions, area, and extending the process of analyzing two-dimensional shapes. Multiplication and division of whole numbers begins with problems involving equal sized groups, arrays, and area models. Unit fractions form the beginning of the development of working with fractions and moves to an understanding of fractions equal to, less than, and greater than one. Area is studied as an attribute of two-dimensional regions. Students measures the area by finding the total number of same size units of area required to cover the shape without gaps or overlaps. Fraction work links to geometry by expressing the area of a part of a shape as a unit fraction of the whole. Mathematical concepts are not presented in isolation but are linked to situations and contexts that are relevant to everyday life. All grade 3 students will complete a summer mathematics project prior to entering grade 3.

Course Instructional Materials

* + - Into Math Book
    - [**hmhco.com/ed**](http://hmhco.com/ed)
    - District Rubric for Constructed Response
    - Rubric for Mathematical Problem Solving/Critical Thinking based on the Mathematical Practices
    - Into Math Games, Learning Centers, and Literature

Standards and NJDOE Mandates Guiding Instruction

* 1. New Jersey Student Learning Standards

<https://www.state.nj.us/education/cccs/>

* 1. Power Standards from NJSLS
     + 3.OA.A Represent and solve problems involving multiplication and division.
     + 3.OA.B Understand properties of multiplication and the relationship between multiplication and division.
     + 3.OA.C Multiply and divide within 100.
     + 3.OA.D Solve Problems involving the four operations, and identify and explain patterns in arithmetic.
     + 3.NF.A Develop understanding of fractions as numbers.
     + 3.MD.A Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
     + 3.MD.C Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

General Interdisciplinary Connections / Materials

* Language Arts: Literature relevant to the topics covered in each unit. Utilize proofreading and editing skills when solving constructed responses.
* Fine and Performing Arts: Utilize instructional videos relevant to the topics covered in each unit. Identify and compare the use of fractions, ratios, and patterns in musical compositions where appropriate.
* Science & Technology: Scientific or Technological advances made during or relevant to the topics covered in each unit. Discover repeated patterns to make predictions and solve problems. Use evidence to support findings and solutions to problems. Use language to describe relationships and change in relationships in a rational way.

Diversity, Equity, and Inclusion

* Use students’ interests in conceptualized tasks
* Expose students to a diverse group of mathematicians
* Design assessments and assignments with a variety of response types
* Use systematic grading and participation methods
* Encourage students to embrace a growth mindset

Pacing Guide

Linden Public Schools

Into Math Pacing Guide

3rd Grade

2022-2023

Routine Building and Center Development – September 2022

**Unit 1 Understand Multiplication and Area**

Module 1- Understand Multiplication – September 8th – September 23rd

**Edmentum BOY Testing September 19th – September 30th**

Module 2- Relate Multiplication and Area – September 27th – October 5th

**Unit 2 Multiplication and Division**

Module  3- Understand Multiplication Strategies – October 6th – October 18th

Module 4 – Apply Multiplication Properties as Strategies – October 19th  – November 1st

Module 5 – Multiplication and Division – November 2nd – November 18th

Module 6 – Multiplication and Division (continued) – November 21st  – December 2nd

Module 7 – Multiplication and Division (continued)– December 5th – December 22nd

Module 8 – Apply Multiplication and Division  – January 2nd  – January 13th

**Unit 3 Addition and Subtraction Strategies and Applications**

Module 9 – Addition and Subtraction Strategies – January 17th – January 30th

**Edmentum MOY Assessment January 23rd to February 3rd**

Module 10 – Addition and Subtraction Within 1,000  – January 31st – February  15th

Module 11  – Understand Perimeter – February 16th – February 27th

Module 12 – Time, Measurement, and Intervals- February 28th – March 8th

**Unit 4 Fractions**

Module 13- Understand Fractions as Numbers – March 9th – March 23rd

Module 14 – Relate Shapes, Fractions and Area – March 24th – March 30th

Module 15 – Compare Fractions- March 31st – April 18th

Module 16 – Understand Equivalent Fractions – April 19th – April 25th

**Unit 5 Measurement and Data**

Module 17 – Liquid Volume and Mass – April 26th – May 3rd

Module 18 -  Represent and Interpret Data – May 4th – May 17th

**Unit 6 Geometry**

Module 19 – Define Two-Dimensional Shapes – May 18th – May 26th

**Edmentum EOY Assessment May 22nd to June 2nd**

Module 20 – Categorize Two-Dimensional Shapes – May 30th – June 5th

Getting Ready for Grade 4 Lessons – To be determined

\***Assessment days are built into each chapter**.

Beginning, Middle, and End-of-the-Year Assessments built into assessment calendar

Vertical Integration – Program Mapping

**Grade 2**

**GEOMETRY**

* Students identify and draw triangles, quadrilaterals, pentagons, and hexagons.

**MEASUREMENT & DATA**

* Students work with equal groups of objects arranged in arrays.
* Students find the total number of objects by writing equations using rows or columns.
* Students generate measurement data with whole numbers on a line plot.
* Students work with picture graphs and bar graphs (single unit scale) to represent data sets with up to four categories.
* Students tell time to the nearest 5 minutes using A.M. and P.M.
* Students develop an understanding of length and describe lengths using numbers and appropriate units.
* Students solve problems involving addition and subtraction of lengths.

**NUMBER AND OPERATIONS-FRACTIONS**

* Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, half of, a third of, etc.

**NUMBER AND OPERATIONS IN BASE 10**

* Students explain the value of the digit and compare numbers through 1,000.
* Fluently add and subtract within 100.
* Add and subtract within 1,000 using various strategies.
* Students explain the value of the digit and compare numbers through 1,000, fluently add and subtract within 1,000 using various strategies.
* Students find the total numbers of groups using arrays as repeated addition.
* Students pair objects to determine if the number is odd or even.
* Students skip count by 2, 5, 10, and 100.

**OPERATIONS AND ALGEBRAIC THINKING**

* Students find the total numbers of groups using arrays and repeated addition.
* Students pair objects to determine if the number is odd or even.
* Students skip count by 2, 5, 10, and 100.
* Students find the total numbers of groups using arrays as repeated addition.
* Students work with equal groups of objects arranged in arrays.
* Students find the total number of objects by writing equations using rows or columns.
* Students solve two-step word problems with addition and subtraction.
* Students represent problems using bar diagrams and equations with a question mark for the unknown value.

**Grade 4**

**GEOMETRY**

* Students draw 2D figures based on lines and angles.
* Students apply the area and perimeter formulas for rectangles in real world problems.

**MEASUREMENT & DATA**

* Students apply the area formula for a rectangle to solve real-world and mathematical problems.
* Students make line plots to display a set of measurements in fractions of a unit.
* Students convert between units within the same system of measurement.
* Students solve real-world problems using area and perimeter formulas for rectangles.

**NUMBER AND OPERATIONS-FRACTIONS**

* Explain, recognize, and generate equivalent fractions.
* Add and subtract fractions with like denominators.
* Multiply fractions by using visual models.

**NUMBER AND OPERATIONS in BASE 10**

* Use place value to round multi-digit numbers to any place.
* Fluently add and subtract through 1,000,000 with the standard algorithm.
* Students interpret a multiplication problem as a comparison. Ex: 35 = 5 x 7 therefore 35 is 5 times as many as 7.
* Students multiply and divide greater numbers.

**OPERATIONS AND ALGEBRAIC THINKING**

* Students interpret a multiplication problem as a comparison. Ex: 35 = 5 x 7 therefore 35 is 5 times as many as 7.
* Students multiply up to four digits by a one-digit whole number, and multiply two two-digit numbers, as well as find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.
* Students perform multi-digit multiplication.
* Students will use strategies and properties to multiply a whole number with up to 4 digits by a 1-digit number, and to multiply two 2-digit numbers.
* Students will use strategies and properties to divide dividends with up to 4 digits by 1-digit divisors.
* Students will solve multi-step problems with the four operations.
* Students will begin to explore one-step problems involving fractions.

Accommodations, Modifications, and Teacher Strategies

(specific recommendations are made in each unit)

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| **Instructional Strategies**   * Teacher Presentation * Student Presentation * Class Discussion * Socratic Discussion * Reading for Meaning * Inquiry Design Model * Interactive Lecture * Interactive Notetaking * Compare and Contrast * Research Based * Problem Based * Project Based   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits occupational or physical therapy | **Gifted and Talent Accommodations and Modifications**   * Allow for further independent research on topics of interest related to the unit of study * Advanced leveled readers and sources * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas | **Special Education and At-Risk Accommodations and Modifications**   * Focus on concept not details * More visual prompts * Leveled readers and teacher annotated sources * Timelines and graphic organizers * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate | **English Language Learners Accommodations and Modifications**   * Focus on concept not details * More visual prompts * Leveled readers and teacher annotated sources * Guided notes with highlighted words and concepts * Use of Merriam-Webster’s ELL dictionary * Timelines and graphic organizers * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate |

Elementary Math Department 6 Point District Rubric for Constructed Response

6

* All of 5 AND
* solves the problem another way in order to check their solution
* OR describes how you might solve this type of problem differently the next time and why

5

* All of 4 AND
* writes a step by step explanation with **grade level** vocabulary of strategies used to solve the problem

4

* (all items below must be included, **if appropriate**)
* all parts of the problem are answered correctly with labels
* a labeled visual representation (diagram, picture, model, graph, chart, table, etc.)
* an equation/number sentence
* writes a step by step explanation of strategies used to solve the problem (the reader can follow the steps to understand how the problem was solved)
* shows all work

3

* has a partially correct answer with a reasonable mathematical plan; may be missing one/some of the items noted in 4

2

* there are multiple errors OR inappropriate explanation OR no explanation is provided; OR has the beginning of a reasonable mathematical plan

1

* major errors are present OR explanation does not relate to the problem
* no response revised July 2016

Constructed Response Revision Rubric

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| **Rubric for Mathematics Problem Solving/Critical Thinking**  **based on the Mathematical Practices** | | | | |
|  | **Expert** | **Practitioner** | **Apprentice** | **Novice** |
| Perseverance | I **try many times** to understand and solve a math problem. | I make **some attempt** to understand and solve a math problem. | I make **one attempt** to understand and solve a math problem. | I make **no** attempt to understand and solve a math problem. |
| Information | I reason what information is needed and not needed to solve this problem | I reason what information is needed and not needed to solve this problem, **most of the time**. | I reason what information is needed and not needed to solve this problem - **some of the time** | It is **difficult** for me to reason what information is needed and not needed to solve this problem. |
| Understanding | I understand the math problem and explain my strategies/steps to others. | I **understand the math** problem and/but it’s **difficult** for me to put into my own words. | I **somewhat understand** the math problem and/but it’s **difficult** for me to put into my own words. | I am having **difficulty understanding** the math problem. |
| Plan | I show **all** my mathematical thinking and strategies to solve the problem. | I show **most** of my mathematical thinking and strategies to solve the problem. | I do not show **much** of my mathematical thinking and strategies to solve the problem. | I do not show any of my mathematical thinking and strategies. |
| Model with mathematics and using appropriate tools | I use math symbols, numbers, and/or math tools, diagrams/pictures to **solve** the problem **correctly**. | I **attempt** to use math symbols, numbers, and/or math tools, diagrams/pictures to solve the problem, but it has a **minor mistak**e. | I **attempt** to use math symbols, numbers, and/or math tools, diagrams/pictures to solve the problem, but it has **mistakes**. | I have **difficulty** using math symbols, numbers, math tools, diagrams/pictures  to solve the problem |
| Revision and Reflection | I revise **on my own**, I use what I already know about math to solve the problem and/or I apply a strategy that I used to solve another math problem. | I revise with **some support**. **If reminded**, I use what I already know about math to solve the problem and/or I apply a strategy that I used to solve another math problem. | I revise **with a lot of help**, prompts or revisiting a strategy. | I only revise with a step by step explanation and **more direct instruction**. |

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| **Unit: Operations and Algebraic Thinking** |
| **Overview:**  • Represent and solve problems involving multiplication and division.  • Understand properties of multiplication and the relationship between multiplication and division.  • Multiply and divide within 100.  • Solve problems involving the four operations and identify and explain patterns in arithmetic.  Time Period: **First Trimester** Length: **12 Weeks** |

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| **STAGE 1 – Desired Results** |

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| **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning  Career Ready Practices  CRP4.  Communicate clearly and effectively and with reason.  CRP6. Demonstrate creativity and innovation.  CRP8.  Utilize critical thinking to make sense of problems and persevere in solving them.   |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  | | --- | | **Introduction- Grade 3** | | |  |  | | --- | --- | | MA.3.3.1 | Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division. | |   **Operations and Algebraic Thinking**   |  |  | | --- | --- | | 3.OA.D | Solve problems involving the four operations, and identify and explain patterns in arithmetic. | | 3.OA.D.8 | Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. | | 3.OA.A | Represent and solve problems involving multiplication and division. | | 3.OA.D.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. | | 3.OA.A.1 | Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. | | 3.OA.A.2 | Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. | | 3.OA.A.3 | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. | | 3.OA.A.4 | Determine the unknown whole number in a multiplication or division equation relating three whole numbers. | | 3.OA.B | Understand properties of multiplication and the relationship between multiplication and division. | | 3.OA.B.5 | Apply properties of operations as strategies to multiply and divide. | | 3.OA.B.6 | Understand division as an unknown-factor problem. | | 3.OA.C | Multiply and divide within 100. | | 3.OA.C.7 | Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. |   **Cluster A**: **Represent and solve problems involving multiplication and division**  **Essential Questions…**   * + - What does multiplication mean and how does it relate to equal groups?     - Why is it important to be able to represent multiplication and division problems using a variety of models?     - How can you multiply with 2 and 4?     - How can you multiply with 5 and 10?     - What are some ways to multiply with 3 and 6?     - How can you use an array or a multiplication table to find an unknown factor or product?     - How can you use the strategy *act it out* to solve problems with equal groups?     - How can you model a division problem to find how many in each group?     - How can you model a division problem to find how many equal groups?     - How can you use bar models to solve division problems?     - How is division related to subtraction?     - How can you use arrays to solve division problems?     - What does dividing by 2 mean?     - What does dividing by 5 mean?     - What strategies can you use to divide by 8?   **Enduring Understanding…**   * + - There are different meanings for multiplication and division.     - Multiplication and division can be represented using a variety of models to solve problems.   **Students will know...**  I. Key Vocabulary/Terms: multiplication, division, product, factor, quotient, array, equation, dividend, divisor, quotient, and equal groups  II. Key Concepts/Ideas: By the end of the year,   * To think in terms of groups of things rather than individual things (unitizing). * To recognize the operation of division in two different types of situations. One situation requires determining how many groups and the other situation requires sharing (determining how many in each group). Students should be exposed to appropriate terminology (quotient, dividend, divisor, and factor). * To apply their understanding of the meaning of the equal sign as “the same as” to interpret an equation with an unknown. * That equations in the form of a x b = c and c = a x b should be used interchangeably, with the unknown in different positions. * That given the products of two whole numbers A and B, students interpret A x B as the total number of objects in A groups of B objects each. * Given a division expression such as 24 ÷ 6, interpret the expression in contexts that require both interpretations of division. * To determine the unknown whole number in a multiplication or division equation relating three whole numbers.   III. Possible Misunderstandings:   * Students may confuse the number of equal groups with the number of objects in each group. * Students may reverse the number of groups and the number in each group when writing a multiplication sentence. * Students may miscount the number in each group by counting tick marks instead of spaces on the number line. * Students may incorrectly make an array to solve a problem. * Students may draw correct pictures of equal groups, but then use the wrong number for the number in each group. * Students may divide a number into groups that are not equal. * Students may reverse the order of the dividend and the divisor when writing a division equation.   **Students will be able to...**   * Use manipulatives to recognize that multiplication is a method used to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. * Use the terms, *factor* and *product*, as they describe multiplication. * Use a variety of representations for creating and solving one-step word problems, i.e., numbers, words, pictures, physical objects, or equations. * Use multiplication and division of whole numbers up to 10 x 10. Students explain their thinking, show their work by using at least one representation, and verify that their answer is reasonable. * Represent word problems in multiple ways: equations, arrays, equal groups, repeated addition, number lines, measurement quantities. * Create word problems for given equations. * Use drawings and equations with a symbol for the unknown number to represent the problem. * Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities.   **Cluster B**: **Understand multiplication and the relationship between multiplication and division**  **Essential Questions…**   * How are multiplication and division related? * How can you use the Commutative Property of Multiplication to find products? * What happens when you multiply a number by 0 or 1? * How can you use the Distributive Property to find products? * How can you use the Associative Property of Multiplication to find products? * How can you use multiplication to divide?   **Enduring Understanding…**   * The properties of multiplication are linked to both multiplication and division. * Multiplication and division are inverse operations   **Students will know...**  I. Key Vocabulary/Terms: multiply, divide, Identity Property of Multiplication, Zero Property of Multiplication, Commutative Property of Multiplication,Distributive Property, inverse operations,factor, product, quotient, dividend, and divisor  II. Key Concepts/Ideas: By the end of the year,   * To correctly apply all three properties of multiplication and explain why each works. * To utilize multiplication facts to understand division as an unknown-factor problem.   III. Possible Misunderstandings:   * Students write an incorrect multiplication fact for an array. * Students may write a product other than zero when multiplying a number by 0. * When using the Distributive Property, students may break a number into its factors instead of its addends. * Students may use an array incorrectly to solve a division problem.   **Students will be able to...**   * Manipulate arrays to see that no matter how you set up a multiplication problem, the product will remain the same (commutative and associative properties). * Break apart arrays to demonstrate the distributive property. * Find missing numbers in a multiplication table to relate division to multiplication (e.g. 15 ÷ 3 = 3 x ?).   **Cluster C**: **Multiply and divide within 100**  **Essential Questions…**   * What strategies can we use to recall multiplication facts? * What strategies can you use to multiply with 7? * What strategies can you use to multiply with 8? * What strategies can you use to multiply with 9? * How can you write a set of related multiplication and division facts? * What strategies can you use to divide by 10? * What strategies can you use to divide by 3? * What strategies can you use to divide by 4? * What strategies can you use to divide by 6? * What strategies can you use to divide by 7? * What strategies can you use to divide by 9?   **Enduring Understanding…**   * Fluency, which means with accuracy, efficiency, and flexibility, plays an important role in developing future mathematical concepts.   **Students will know...**  I. Key Vocabulary/Terms: Commutative Property of Multiplication, related facts, dividend, array,multiply, divide, factor, product, and quotient  II. Key Concepts/Ideas: By the end of the year,   * To fluently multiply any one-digit number by any one-digit numbers. * To express the relationship between multiplication and division. * To fluently divide within 100 utilizing their knowledge of division as an unknown product problem.   III. Possible Misunderstandings:   * Students may use the Distributive Property correctly but find an incorrect product for one of the facts. * Students may find an incorrect product if they use repeated addition to find the product. * Students may not recall a related multiplication fact correctly. * Students may use an incorrect number when writing a related fact.   **Students will be able to...**   * Identify patterns that demonstrate multiplication facts for 1’s, 2’s, 5’s, 9’s, and 10’s. * Apply multiplication facts of 1’s, 2’s, and 5’s to multiplication facts of 3’s, 4’s, 6’s, 7’s, and 8’s. * Break apart arrays to demonstrate the distributive property (e.g. 8 x 7 = 8 x (5 + 2) = 8 x 5 + 8 x 2 = 40 +16). * Find missing numbers in a multiplication table to relate division to multiplication (e.g. 15 ÷ 3 = 3 x ?).   **Cluster D**: **Solve problems involving the four operations; and identify & explain patterns in arithmetic**  **Essential Questions…**   * How can patterns in arithmetic be used as tools to solve multi-step problems? * How do we know if an answer is reasonable? * How can you use properties to explain patterns on the addition table? * How can you use the strategy *draw a diagram* to solve one- and two-step addition and subtraction problems? * How can you use properties to explain patterns on the multiplication table? * How can you use the strategy *make a table* to solve multiplication problems? * What are some ways you can describe a pattern in a table? * How can you use the strategy *act it out* to solve two-step problems? * Why are there rules such as the order of operations?   **Enduring Understanding…**   * There are multiple problem solving strategies. * Understanding patterns in arithmetic helps us solve word problems. * Showing how we know an answer is reasonable leads to deeper conceptual understanding.   **Students will know...**  I. Key Vocabulary/Terms: operation, pattern, order of operations, multiply, divide, factor, product, quotient, subtract, add, addend, sum, difference,  II. Key Concepts/Ideas: By the end of the year,   * To explain and apply rules for a pattern using properties of operations. * To apply patterns to know whether products are reasonable. * To apply patterns and the distributive property to solve multiplication problems. * Identify arithmetic patterns and explain them using properties of operations   III. Possible Misunderstandings:   * Students may have difficulty determining how to label the bars in the bar model. * Students may forget a step in a multi-step problem. * Students may make errors in determining the correct order of operations   **Students will be able to...**   * Use reasoning skills to break multi-step problems in order to solve. * Identify patterns that demonstrate multiplication facts for 1’s, 2’s, 5’s, 9’s, and 10’s. * Apply multiplication facts of 1’s, 2’s, and 5’s to multiplication facts of 3’s, 4’s, 6’s, 7’s, and 8’s. * Utilize the distributive property and arrays to demonstrate how to break even factors into equivalent parts (e.g.  7 x 4 = 7 x (2 + 2) = 7 x 2 + 7 x 2= 14 +14 or 5 x 6 = 5 x 3 + 5 x 3). |

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| **Unit: Number and Operations in Base Ten** |
| **Overview:**  • Use place value understanding and properties of operations to perform multi-digit arithmetic.  Time Period: **Second Trimester** Length: **12 Weeks** |

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| **STAGE 1 – Desired Results** |

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| **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning  Career Ready Practices  CRP4.  Communicate clearly and effectively and with reason.  CRP6. Demonstrate creativity and innovation.  CRP8.  Utilize critical thinking to make sense of problems and persevere in solving them.   |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  | | --- | | **Introduction- Grade 3** | | |  |  | | --- | --- | | MA.3.3.1 | Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Number and Operations in Base Ten**   |  |  | | --- | --- | | 3.NF.A.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram. | | 3.NF.A.2a | Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. | | 3.NF.A.2b | Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. | | 3.NF.A.3 | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. | | 3.NF.A.3a | Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. | | 3.NF.A.3b | Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. | | 3.NF.A.3c | Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. | | 3.NF.A.3d | Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. | | 3.NF.A | Develop understanding of fractions as numbers. | | 3.NF.A.1 | Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. | |   **Cluster A**: **Use place value and properties of operations to perform multi-digit arithmetic**  **Essential Questions…**   * How can using place value help us solve computation problems? * How can you use the strategy *draw a diagram* to multiply with multiples of 10? * What strategies can you use to multiply with multiples of 10? * How can you model and record multiplying 1- digit whole numbers by multiples of 10?   **Enduring Understanding…**   * The value of a digit is determined by the place value. * Place value helps us understand and manipulate large numbers. * There are different mathematical properties that help us efficiently add, subtract, multiply and divide.   **Students will know...**  I. Key Vocabulary/Terms: place value, addition, addend, sum, compatible numbers, estimate, Associative Property of Addition, Commutative Property of Addition, Identity Property of Addition, and difference  II. Key Concepts/Ideas: By the end of the year,   * To round whole numbers to the nearest 10 or 100 using the given rule of place value for rounding up or down. * To explain an efficient strategy for adding and subtracting within 1000, and be able to accurately apply that strategy. * To multiply single digit numbers by multiples of 10 using an accurate and efficient strategy.   III. Possible Misunderstandings:   * Students may round numbers incorrectly because they do not look at the place to the immediate right of the place being rounded. * Students may change the order of addends, without finding an easier way to add. * Students may make errors in the value of a digit when breaking apart addends to add. * When using the place value strategy, students may forget to regroup and instead write a 2-digit number in one place. * Students may regroup incorrectly.   **Students will be able to...**   * Use number lines to round to the nearest 10 or 100. * Use the value of the digits in the number to round up or down to the nearest 10 or 100. * Break numbers apart by place value; use expanded notation. * Practice addition and subtraction of numbers within 1000 with place value materials: ones cubes, tens rods, hundreds flats, and thousands cube. * Use place value charts to organize numbers in tens, ones, hundreds, thousands. * Use pictorial models and abstract models to represent addition and subtraction with number sentences. * Use a variety of strategies to add and subtract: Partial sums, Column addition/subtraction, Adding up, and Regrouping. * Justify thinking and reasoning of different algorithms through a variety of speaking and writing activities. * Practice one digit multiplication prior to this work and use arrays in multiplication. * Use different properties of operations to solve addition, subtraction, and multiplication problems: commutative property, associative property, and distributive property * Look for patterns when multiplying one-digit numbers by ten. |

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| **Unit: Number and Operations - Fractions** |
| **Overview:**  • Develop understanding of fractions as numbers.  Time Period: **Third Trimester** Length: **6 Weeks** |

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| **STAGE 1 – Desired Results** |

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| **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning  Career Ready Practices  CRP4.  Communicate clearly and effectively and with reason.  CRP6. Demonstrate creativity and innovation.  CRP8.  Utilize critical thinking to make sense of problems and persevere in solving them.   |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  | | --- | | **Introduction- Grade 3** | | |  |  | | --- | --- | | MA.3.3.2 | Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Number and Operations – Fractions**   |  |  | | --- | --- | | 3.NF.A.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram. | | 3.NF.A.2a | Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. | | 3.NF.A.2b | Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. | | 3.NF.A.3 | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. | | 3.NF.A.3a | Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. | | 3.NF.A.3b | Recognize and generate simple equivalent fractions (e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. | | 3.NF.A.3c | Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. | | 3.NF.A.3d | Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. | | 3.NF.A | Develop understanding of fractions as numbers. | | 3.NF.A.1 | Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. | |   **Cluster A**: **Develop understanding of fractions as numbers**  **Essential Questions…**   * What do the numerator and denominator of a fraction represent? * How do we place fractions on a number line? * How do we know if different fractions are equivalent? * What are equal parts of a whole? * Why do you need to know how to make equal shares? * What do the top and bottom numbers of a fraction tell? * How does a fraction name part of a whole? * How can you represent and locate fractions on a number line? * When might you use a fraction greater than 1 or a whole number? * How can a fraction name part of a group? * How can a fraction tell how many are in part of a group? * How can you use the strategy *draw a diagram* to solve fraction problems? * How can you use the strategy *act it out* to solve comparison problems? * How can you compare fractions with the same denominator? * How can you compare fractions with the same numerator? * What strategies can you use to compare fractions? * How can you compare and order fractions? * How can you use models to find equivalent fractions? * How can you use models to name equivalent fractions?   **Enduring Understanding…**   * Fractions can be used to represent parts of a whole. * Fractions are part of the same number system as whole numbers and can be placed in order, frequently falling between two whole numbers. * Specifying the whole is necessary for identifying and comparing fractional parts.   **Students will know...**  I. Key Vocabulary/Terms: equal parts, eighths, fourths, halves, sixths, thirds, whole, unit fraction, fraction, fraction greater than 1, denominator, equivalent, and equivalent fraction  II. Key Concepts/Ideas: By the end of the year,   * Fractions are numbers that can represent a portion of a whole or a point on a number line. * Fractional parts must be equal sized. * On a number line, recognize that the equal parts between 0 and 1 have a fractional representation. * On a number line, the end of each equal part is represented by a fraction (1/the # of equal parts) * On a number line, the endpoint of each equal part represents the total number of equal parts. * On a number line, a whole can be represented by equivalent fractional pieces. * To explain why fractions are equivalent. * A fraction is another way to express division. * Comparisons are only valid if the wholes are identical.   III. Possible Misunderstandings:   * Students might have difficulty recognizing equal parts. * Students might have difficulty making equal shares when there is a part left over. * Students might count only the unshaded parts as the denominator. * Students do not label a point on the number line correctly. * Students might have difficulty identifying the denominator for fractions greater than 1. * Students may count marks instead of spaces as units when locating fractions on a number line to compare. * Students might order fractions by comparing numbers for the denominators rather than the size of pieces. * Students may think that fractions with the same numerator are equivalent.   **Students will be able to...**   * Decompose shapes into unit fractions. * Identify the equal parts that the denominator represents. * Locate fractions on a number line. * Identify the count of the number of equal parts that numerator represents. * Identify unit fractions from a shape. * Define the interval from 0-1 on a number line as the whole. * Divide a whole on a number line into equal parts. * Represent each equal part on a number line with a fraction. * Represent fractions equal to, less than, and greater than one. * Divide a whole on a number line into equal parts. * Represent each equal part on a number line with a fraction. * Represent equal parts using fraction notation. * Generate simple equivalent fractions. * Express whole numbers as fractions. * Compare fractions using >, =, or <. |

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| **Unit: Measurement and Data** |
| **Overview:**  • Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.  • Represent and interpret data.  • Geometric measurement: understand concepts of area and relate area to multiplication and to addition.  • Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.  Time Period: **Third Trimester** Length: **3 Weeks** |

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| **STAGE 1 – Desired Results** |

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| **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning  Career Ready Practices  CRP4.  Communicate clearly and effectively and with reason.  CRP6. Demonstrate creativity and innovation.  CRP8.  Utilize critical thinking to make sense of problems and persevere in solving them.   |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  | | --- | | **Introduction- Grade 3** | | |  |  | | --- | --- | | MA.3.3.1 | Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Measurement and Data**   |  |  | | --- | --- | | 3.MD.C.7b | Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. | | 3.MD.A.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. | | 3.MD.C.7c | Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning. | | 3.MD.B | Represent and interpret data. | | 3.MD.B.3 | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. | | 3.MD.B.4 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. | | 3.MD.C | Geometric measurement: understand concepts of area and relate area to multiplication and to addition. | | 3.MD.C.7d | Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. | | 3.MD.D | Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. | | 3.MD.D.8 | Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. | | 3.MD.C.5 | Recognize area as an attribute of plane figures and understand concepts of area measurement. | | 3.MD.A | Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. | | 3.MD.C.5a | A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. | | 3.MD.A.1 | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. | | 3.MD.C.5b | A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. | | 3.MD.C.6 | Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units). | | 3.MD.C.7 | Relate area to the operations of multiplication and addition. | | 3.MD.C.7a | Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. | |   **Cluster A**: **Solve problems involving measurement and estimation of time, volumes, and masses.**  **Essential Questions…**   * What time is it? * What are we measuring and how are we measuring it? * How can measurement be used to solve problems? * How can you tell time to the nearest minute? * How can you tell when to use A.M. and P.M. with time? * How can you measure elapsed time in minutes? * How can you find a starting time or an ending time when you know the elapsed time? * How can you use the strategy *draw a diagram* to solve problems about time? * How can you estimate and measure liquid volume in metric units? * How can you estimate and measure mass in metric units? * How can you use models to solve liquid volume and mass problems?   **Enduring Understanding…**   * Time can be documented linearly. * Liquid volumes and mass of objects can be measured. * What we measure affects how we measure.   **Students will know...**  I. Key Vocabulary/Terms: estimate, time, time intervals, elapsed time, minute, analog clock, digital clock, hour, half hour, quarter hour, A.M., midnight, noon, P.M., measure, liquid volume, liter, gram, kilogram, and mass  II. Key Concepts/Ideas: By the end of the year,   * How to interpret time. * How to use the units of mass and volume.   III. Possible Misunderstandings:   * Students may tell the wrong hour. * Students might confuse A.M. and P.M. * Students count incorrectly on a number line or an analog clock. * Students cannot identify the half-inch marks on a ruler. * Students may incorrectly measure liquid volume.   **Students will be able to...**   * Solve elapsed time word problems (to the minute). * Solve elapsed time word problems using an open number line. * Create a timeline of a typical day’s activities. * Use a scale to measure the mass of various objects. * Measure liquid using various measuring cups. * Solve one-step word problems involving masses or volumes that are given in the same unit.   **Cluster B**: **Represent and interpret data**  **Essential Questions…**   * How can data be represented? * How can picture graphs, bar graphs, and line plots be used to show data and solve problems? * How can you generate measurement data and show the data on a line plot? * How can you use the strategy *make a table* to organize data and solve problems? * How can you read and interpret data in a picture graph? * How can you draw a picture graph to show data in a table? * How can you read and interpret data in a bar graph? * How can you draw a bar graph to show data in a table or picture graph? * How can you solve problems using data represented in bar graphs? * How can you read and interpret data in a line plot?   **Enduring Understanding…**   * We can represent, interpret, and analyze data.   **Students will know...**  I. Key Vocabulary/Terms: frequency table, tally table, key, picture graph, bar graph, horizontal bar graph, scale, vertical bar graph, data, graph, and line plot  II. Key Concepts/Ideas: By the end of the year,   * To use data from tables and graphs in Science and Social Studies textbooks, newspapers or magazines to solve real-world problems. * To connect their understanding of fractions to measuring to one-half and one-quarter inch.   III. Possible Misunderstandings:   * Students may not understand what each symbol in a picture graph represents. * Students may incorrectly translate data to a picture graph. * Students may not accurately represent data when creating a scaled graph. * Students may read the numbers incorrectly for the length of the bars on a bar graph. * Students may not draw a bar correctly when transferring data from another type of graph. * Students may have difficutly with finding and using the correct data from the bar graph to solve the problem. * Student may write the number of times a number occurs rather than the number that occurred the most times or the fewest times on a line plot.   **Students will be able to...**   * Use rulers to create increments on a graph in whole numbers, halves, and quarters. * Draw a scaled picture graph and a scaled bar graph. * Create increments on a graph in whole numbers, halves, and fourths (quarters). * Make a line plot with horizontal scale in whole numbers, halves, or quarters. * Solve one- and two-step problems using graphs.   **Cluster C**: **Understand concepts of area. Relate area to multiplication and to addition**  **Essential Questions…**   * How can we model a multiplication problem in a rectangular array? * Why is area measured in square units? * What strategies can we use to find the area of a rectilinear figure (a polygon with all right angles)? * How is finding the area of a figure different from finding the perimeter of a figure? * How can you find the area of a plane figure? * Why can you multiply to find the area of a rectangle? * How can you use the strategy *find a pattern* to solve area problems? * How can you break apart a figure to find the area?   **Enduring Understanding…**   * All multiplication problems can be modeled with a rectangular array. * The rectilinear figure can be decomposed into two or more rectangles   **Students will know...**  I. Key Vocabulary/Terms: area, square unit, square meter, square centimeter, and square inches  II. Key Concepts/Ideas: By the end of the year,   * To relate area of rectangles to multiplication and addition. * To recognize area as additive. * To understand and explain why multiplying the side lengths of a rectangle yields the same measurement of area as counting the number of tiles. * To explain that one length tells how many unit squares in a row and the other length tells how many rows. * That decomposing a rectilinear figure can help you find the area.   III. Possible Misunderstandings:   * Students find the perimeter instead of the area. * Students count the number of unit squares incorrectly. * Students count the number of unit squares in each row incorrectly. * Students forget to add the areas of the smaller figures together.   **Students will be able to...**   * Draw and cut out arrays of different areas. * Model the solution of one-digit and two-digit multiplication problems with an array model. * Using tiles, estimate the area of a rectangular shape (not necessarily a perfect fit). * Using graph paper, estimate the area of an irregular shape. * Break apart a shape into rectangular sections to find the total area. * Solve real life word problems involving area of rectangular shapes.   **Cluster D**: **Recognize perimeter and distinguish between linear and area measures**  **Essential Questions…**   * How can we find the perimeter of polygons? * How can the perimeters and areas of rectangles be compared and contrasted? * How can you find perimeter? * How can you measure perimeter? * How can you find the unknown length of a side in a plane figure when you know its perimeter? * How can you use area to compare rectangles with the same perimeter? * How can you use perimeter to compare rectangles with the same area?   **Enduring Understanding…**   * Perimeter is a linear measurement that can be found using the measurement of its sides. * Perimeter and area are different concepts that are measured differently.   **Students will know...**  I. Key Vocabulary/Terms: perimeter, polygon  II. Key Concepts/Ideas: By the end of the year,   * Polygons with equivalent areas do not necessarily have the same perimeter. * Polygons with equivalent perimeters do not necessarily have the same area.   III. Possible Misunderstandings:   * Students count incorrectly when finding the perimeter of an irregular figure. * When a length is not given, the length is assumed. * Students forget to add a side length when finding perimeter. * Students may confuse area with perimeter.   **Students will be able to...**   * Find the perimeter of polygons given the side length. * Find an unknown side of a polygon when given the perimeter and all but one side. * Construct rectangles with the same perimeter and different areas or with the same area and different perimeters (using geoboards, graph paper, etc.) * Solve real life word problems involving perimeter and area of polygons. |

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| **Unit: Geometry** |
| **Overview:**  • Reason with shapes and their attributes.  Time Period: **Third Trimester** Length: **3 Weeks** |

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| **STAGE 1 – Desired Results** |

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| **Mathematical Practices**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning  Career Ready Practices  CRP4.  Communicate clearly and effectively and with reason.  CRP6. Demonstrate creativity and innovation.  CRP8.  Utilize critical thinking to make sense of problems and persevere in solving them.   |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  |  | | --- | --- | | **Introduction- Grade 3** | | | |  |  | | --- | --- | | MA.3.3.4 | Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole. | | | | **Geometry**  3.G.A | | Reason with shapes and their attributes. | | 3.G.A.1 | | Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. | | 3.G.A.2 | | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. |   **Cluster A**: **Reason with shapes and their attributes**  **Essential Questions…**   * How can we sort shapes based upon their attributes? * How can shapes be divided into equal sections to represent part to whole? * What are some ways to describe two-dimensional shapes? * How can you describe angles in plane shapes? * How can you use line segments and angles to make polygons? * How can you describe line segments that are sides of polygons? * How can you use sides and angles to help you describe quadrilaterals? * How can you draw quadrilaterals? * How can you use sides and angles to help you describe triangles? * How can you use the strategy *draw a diagram* to classify plane shapes? * How can you divide shapes into parts with equal areas?   **Enduring Understanding…**   * Shapes can be sorted based on their attributes.   **Students will know...**  I. Key Vocabulary/Terms: attributes, closed shape, endpoint, line, line segment, open shape, plane shape, point, ray, angle, right angle, vertex, decagon, hexagon, octagon, pentagon, polygon, quadrilateral, side, triangle, intersecting lines, parallel lines, perpendicular lines, rhombus, rectangle, square, two-dimensional, three-dimensional, and quadrilaterals  II. Key Concepts/Ideas: By the end of the year,   * To identify quadrilaterals that do not have to look like rectangles. * To recognize that quadrilaterals have four sides with shared attributes that can be categorized and subcategorized. * To identify fractional components of the interior of a quadrilateral that are smaller than fourths.   III. Possible Misunderstandings:   * Students might confuse lines, line segments, and rays. * Students may not be able to tell if an angle is less than or greater than a right angle. * Students might confuse the names of the shapes. * Students may not identify a square as a rectangle or a rhombus. * Students may not be able to identify sides of equal length or the types of angles. * Students may not look for all the correct attributes.   **Students will be able to...**   * Identify attributes that classify a shape as a quadrilateral. * Use real world objects to categorize shapes into quadrilaterals and non-quadrilaterals. * Construct quadrilaterals using geoboards, graph paper, dot paper, etc. * Compare, contrast, and categorize the five special quadrilaterals (square, rectangles, parallelograms, rhombuses, and trapezoids). |

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| **STAGE 2 – Evidence of Learning** |

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| **Formative Activities, Tasks, or Projects:**   * Oral or written responses to the essential questions. * Materials produced as a result of class discussion or activities. * Using discipline vocabulary in appropriate context. * Quiz or test on information relevant to the unit. * 3-Minute Pause * Observation * Choral Response * Debriefing * Exit Card / Ticket * Hand signals * Inside-Outside Circle Discussion (Fishbowl) * Misconception Check * Questions and Answers * Quiz * Self-Assessment * Student Conference * Think-Pair-Share * Web or Concept Map   **Summative Activities, Tasks, or Projects:**   * Module Tests * Edmentum Beginning of the Year * Edmentum Middle of the Year Assessment * Edmentum End of the Year Assessment * District Mandated Tasks   **Authentic Assessment Suggestions**   * Performance Tasks * District Mandated Tasks |

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| **STAGE 3 – Learning Plan** |

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| **Instructional Map**  **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * Analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for remediation and enrichment.   Reassess student performance and provide opportunities for application.  **Unit Specific Accommodations and Modifications**  Gifted and Talent Accommodations and Modifications:   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Flexibility in assignments * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity   English Language Learners, Special Education, and At-Risk Accommodations and Modifications:  ELL Students:   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Tiered centers, assignments, lessons, or products * Deliver the content in “chunks” * Use technology, if available and appropriate * Differentiate homework and products * Define key vocabulary, multiple-meaning words, and figurative language * Use audio and visual supports, if available and appropriate * Meet with small groups to reteach idea/skill * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Strategy and flexible groups based on formative assessment   Special Education Students:   * Remove unnecessary material, words, etc., that can distract from the content * Provide appropriate scaffolding * Tiered centers, assignments, lessons, or products * Deliver the content in “chunks” * Use technology, if available and appropriate * Varied questioning strategies * Provide background knowledge * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Present ideas using auditory, visual, kinesthetic, & tactile means * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate   Differentiation Strategies for At Risk Students:   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Deliver the content in “chunks” * Use technology, if available and appropriate * Varied questioning strategies * Provide background knowledge * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits   **Differentiation**   |  |  |  |  | | --- | --- | --- | --- | | **High-Achieving Students** | **On Grade Level Students** | **Struggling Students** | **Special Needs/ELL** | | * Into Math Challenge * Game and Activity Cards * Small Group Mini Lesson: Ready For More * Unit Project Cards * STEM Task * Centers | * Into Math Reteach * Game and Activity Cards * Small Group Mini Lesson: On Track * Unit Project Cards * STEM Task * Centers | * Into Math Reteach * Game and Activity Cards * Small Group Mini Lesson: Almost There * Unit Project Cards * Interactive Tiers * STEM Task * Centers | * Into Math Reteach * Game and Activity Cards * Small Group Mini Lesson * Unit Project Cards * Tier 3 Intensive Intervention * Multilingual Glossary * STEM Task * Centers |  |  |  | | --- | --- | | Instructional Best Practices | | | **Required Best Practices**   * Use of Mathematical Vocabulary * Lesson Closure * Effective Questioning Techniques * Math Centers * Small Group Mini Lessons * Concrete-Pictorial- Abstract * Use of manipulatives | **Suggested Best Practices**   * Peer Collaboration * Think Aloud * Gallery Walks |   **Unit Specific Interdisciplinary Connections / Materials**  With interdisciplinary instruction, the subject areas are woven together and explored through an overarching theme or concept. We use math to help us solve everyday problems in the kitchen, in the garden, and for many of us at our jobs.    Brain research has shown that information in our brains is organized in schematic structures. These structures are made up of interconnected bits of information and serve as a framework for the knowledge we acquire. When a learner’s knowledge is connected, it is much more likely that they will apply the prior knowledge to a wide variety of new situations. They will acquire new information in a way that is more accessible and will be better able to relate it to previously acquired knowledge.    Students learn about patterns in math, science, social studies, and even literature. Because of this, they are much more likely to “see” these patterns when they encounter new situations. Since patterns are not only studied in math they are able to make the connection and gain the understanding that patterns can be found in many areas of their lives.  Interdisciplinary instruction allows students to understand the interconnectedness of the disciplines and makes learning more meaningful and relevant as fascinating connections are made across the subject areas.  **Science:**  **Patterns**   * Patterns of change can be used to make predictions. (3-PS2-2)   **Social Studies:**  6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.  6.1.2.CivicsPR.3: Analyze classroom rules and routines and describe how they are designed to  benefit the common good.  6.1.2.CivicsPR.4: Explain why teachers, local community leaders, and other adults have a  responsibility to make rules that are fair, consistent, and respectful of individual rights.  6.1.5.CivicsPR.1 Compare procedures for making decisions in a variety of settings including classroom, school, government, and /or society.  6.1.5.HistoryUP.7: Describe why it is important to understand the perspectives of other cultures in an interconnected world.  **Language Arts:**  RL.3.1. Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.  NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.  NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. |

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| **Additional Materials** |

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| Digital Resources   * Use the following resources on HMH Ed: Tier 1,2,3 Intervention, Response to Intervention, Vocabulary Games for each Chapter, iTools, Interactive Reteach, Interactive Challenge, Interactive Lessons, Interactive Module Practice * Prodigy, Edmentum, and Online Games   <https://achievethecore.org/>  <https://resources.newmeridiancorp.org/math-test-design/>  <https://www.state.nj.us/education/cccs/2016/math/>  <https://achievethecore.org/content/upload/Add%20Subtract%20Situation%20Types.pdf>  (Common Addition and Subtraction Situations)  <https://achievethecore.org/content/upload/Mult%20Div%20Situation%20Types.pdf>  (Common Multiplication and Division Situations)  [https://illuminations.nctm.org](https://illuminations.nctm.org/)  <https://www.state.nj.us/education/modelcurriculum/>  <http://archive.dimacs.rutgers.edu/nj_math_coalition/framework.html>  <https://parcc-assessment.org/released-items/>  <https://linden.instructure.com/courses/3955> | Printed Resources  Into Math Student Book  Practice and Homework Journal  Tools for Thoughtful Assessment  Math Tools |