# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| ***Unit 1: Properties of Multiplication & Division and Solving Problems with Units of 2-5 and 10***<br><br>**(Approximate Instructional Time: 5 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| • 3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as 5 x 7. | MP 2 Reason abstractly and quantitatively.<br><br>MP.4 Model with mathematics. | Concept(s): Multiplication and the meaning of factors.<br>• Multiplication is a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group.<br>• Multiplication gives the same result as repeated addition.<br>• Product of two whole numbers is the total number of objects in a number of equal groups.<br><br>Students are able to:<br>• conceptually understand *equal groups of* as multiplication.<br>• relate multiplication to the array model.<br>• interpret the meaning of factors - the size of the group or the number of groups.<br>• skip-count objects in array models.<br>• find related multiplication facts by adding and subtracting equal groups in array models<br>• model the distributive property with arrays to decompose units as a strategy to multiply<br>• use repeated addition to find the total number of objects arranged in an array and in equal groups and compare to the result of multiplication.<br><br>**Learning Goal 1:** Build conceptual understanding of multiplication for units of 2 and 3 using the array model. |

| | | |
|---|---|---|
| • 3.OA.B.6. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8. | MP.3 Construct viable arguments and critique the reasoning of others.<br><br>MP.6 Attend to precision.<br><br>MP.7 Look for and make use of structure. | Concept(s): Division concepts<br>• Division can be represented as a multiplication problem having an unknown factor.<br>• Relationships between factors, products, quotients, divisors and dividends.<br><br>Students are able to:<br>• model division as the unknown factor in multiplication using arrays and tape diagrams.<br>• write division number sentences as unknown factor problems.<br>• solve division of whole numbers by finding the unknown factor.<br><br>**Learning Goal 2:** Solve division of whole numbers by representing the problem as an unknown factor problem. |
| • 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. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8. | MP 2 Reason abstractly and quantitatively.<br><br>MP.4 Model with mathematics. | Concept(s): Division concepts<br>• Division is a means to finding equal groups of objects.<br>• Division gives the same result as repeated subtraction.<br>• Quotient of two whole numbers is the number of objects in each share when objects are grouped equally into shares.<br>• Quotient of two whole numbers is the number of shares when objects are grouped into equal shares of objects.<br><br>Students are able to:<br>• interpret division of whole numbers as a number of equal shares or the number of groups when objects are divided equally using an array model.<br>• interpret the quotient as the number of groups or the number of objects in each group using units of 2 and 3.<br><br>**Learning Goal 3:** Build conceptual understanding of division using units 2 and 3, and interpret the quotient as a set of objects (up to 100) partitioned equally into a number of shares and as the number of equal shares. |
| • 3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and | MP.1 Make sense of problems and persevere in solving them. | Concept(s): Distributive property and problem solving using units of 2-5 and 10.<br><br>Students are able to:<br>• multiply to solve word problems involving equal groups and arrays. |

| | | |
|---|---|---|
| measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. *(benchmarked) | MP.4 Model with mathematics. | • divide to solve word problems involving equal groups and arrays.<br>• represent a word problem with a drawing showing equal groups, arrays, equal shares, and/or total objects.<br>• represent a word problem with an equation.<br><br>**Learning Goal 4:** Use multiplication and division within 100 to solve word problems by modeling equal groups or arrays and by writing equations to represent equal groups or arrays |
| • 3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \div 3$, $6 \times 6 = ?$. | MP 2 Reason abstractly and quantitatively.<br><br>MP.7 Look for and make use of structure. | Concept(s): Division concepts for units of 2 and 3<br>• Equal sign indicates that the value of the numerical expressions on each side are the same.<br>• Unknown in an equation ( 4 x __ = 20 and 20 = ? x 4) represents a number.<br>• Unknown can be in different positions.<br>• Letters can represent numbers in equations.<br><br>Students are able to:<br>• determine which operation is needed to find the unknown.<br><br>**Learning Goal 4:** Determine the unknown in a division or multiplication equation. |
| • 3.OA.B.5. Apply properties of operations as strategies to multiply and divide.<br>*Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*<br>*[Students need not use the formal terms for these properties.] | MP.3 Construct viable arguments and critique the reasoning of others.<br><br>MP.5 Use appropriate tools strategically.<br><br>MP.6 Attend to precision.<br><br>MP.7 Look for and make use of structure. | Concept(s): Division concepts for units of 2-5 and 10<br>• Properties are rules about relationships between numbers.<br>• Changing the order of factors does not change the result of multiplication.<br>• Changing the order of numbers does change the result of division.<br>• Area of a rectangle with whole-number side lengths $a$ and $b + c$ is the sum of $a \times b$ and $a \times c$.<br>• Area models can be used to represent the distributive property.<br><br>Students are able to:<br>• relate arrays to tape diagrams to model the commutative property of multiplication.<br>• use the distributive property as a strategy to find related multiplication facts.<br>• use tiling to show that the area of a rectangle with whole-number side lengths $a$ and $b + c$ is the sum of $a \times b$ and $a \times c$.<br>• apply the distributive property to decompose units. |

| | | |
|---|---|---|
| *[Limit to single digit factors and multipliers. 7 x 4 x 5 would exceed grade 3 expectations because it would result in a two-digit multiplier (28 x 5)] | | **Learning Goal 5:** Multiply one-digit whole numbers by applying the properties of operations (commutative, associative, and distributive properties).<br><br>**Learning Goal 6:** Use tiling and an area model to represent the distributive property. |
| • 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. *(benchmarked) | MP 2 Reason abstractly and quantitatively.<br><br>MP.7 Look for and make use of structure.<br>MP.8 Look for and express regularity in repeated reasoning. | Concept(s): Multiplication and division using units of 4<br><br>Students are able to:<br>• skip-count objects in models to build fluency with multiplication facts using units of 4.<br>•<br>• model the relationship between multiplication and division.<br>• multiply and divide within 40 with accuracy and efficiency.<br><br>**Learning Goal 7:** Fluently multiply and divide within 40 using strategies such as the relationship between multiplication and division. |
| • 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. *(benchmarked) | MP.1 Make sense of problems and persevere in solving them.<br>MP 2 Reason abstractly and quantitatively.<br>MP.3 Construct viable arguments and critique the reasoning of others.<br>MP 4. Model with mathematics<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision. | Concept(s):<br>• Letters or symbols in an equation represent an unknown quantity.<br><br>Students are able to:<br>• solve two-step word problems involving multiplication and division, and assess the reasonableness of answers.<br>• solve two-step word problems involving all four operations, and assess the reasonableness of answers.<br><br>**Learning Goal 8:** Write equations when solving two-step word problems, using a symbol for an unknown; find the value of an unknown in an equation involving any of the four operations and use estimation strategies to assess the reasonableness of answers. |

| | |
|---|---|
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or |

| | |
|---|---|
| | subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.<br>D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.** |

| | |
|---|---|
| | **CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** (Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

| **District/School Primary and Supplementary Resources** | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 1)**<br><br>**Zearn.org** | **Supplementary Resources:**<br>Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***First In Math***<br>***Excel Math*** (Publisher: AnsMar)<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *18 counters per student*<br>❑ *Tape diagram (a method for modeling problems)* | 3.OA.A.2 Fish Tanks |

| | |
|---|---|
| ❑ *Number bond (see module overview)*<br>❑ *Array (arrangement of objects in rows and columns)* | 3.OA.A.3 Two Interpretations of Division<br><br>3.OA.A.3 Analyzing Word Problems Involving Multiplication<br><br>3.OA.A.4 Finding the unknown in a division equation<br><br>3.OA.B.5 Valid Equalities? (Part 2)<br><br>3.OA.C.7 Kiri's Multiplication Matching Game<br><br>3.OA.D.8 The Class Trip |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated Math programs | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Array** (arrangement of objects in rows and columns) *Note: Originally introduced in Grade 2, Module 6 but treated as new vocabulary in this module*<br>• **Commutative property/commutative** (e.g., rotate a rectangular array 90 degrees to demonstrate that factors in a multiplication sentence can switch places)<br>• **Equal groups** (with reference to multiplication and division; one factor is the number of objects in a group and the other is a multiplier that indicates the number of groups)<br>• **Distribute** (with reference to the distributive property, e.g., in $12 \times 3 = (10 \times 3) + (2 \times 3)$ the 3 is the multiplier for each part of the decomposition)<br>• **Divide/division** (partitioning a total into equal groups to show how many |

| | |
|---|---|
| | equal groups add up to a specific number, e.g., 15 ÷ 5 = 3)<br>● **Factors** (numbers that are multiplied to obtain a product)<br>● **Multiplication/multiply** (an operation showing how many times a number is added to itself, e.g., 5 × 3 =15)<br>● **Number of groups** (factor in a multiplication problem that refers to the total equal groups)<br>● **Parentheses** (symbols ( ) used around an expression or numbers within an equation)<br>● **Quotient** (the answer when one number is divided by another)<br>● **Rotate** (turn, used with reference to turning arrays 90 degrees)<br>● **Row/column** (in reference to rectangular arrays)*Note: Originally introduced in Grade 2, Module 6 but treated as new vocabulary in this module*<br>● **Size of groups** (factor in a multiplication problem that refers to how many in a group)<br>● **Unit** (one segment of a partitioned tape diagram)<br>● **Unknown** (the missing factor or quantity in multiplication or division) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- ❖ **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.
- ❖ **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
**2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
**2.NBT.2** Count within 1000; skip-count by 5s, 10s, and 100s.

***Common Misconceptions:***

- Students think a symbol (? or []) is always the place for the answer. This is especially true when the problem is written as 15 ÷ 3 =? or 15 = x 3.
- Students also think that 3 ÷ 15 = 5 and 15 ÷ 3 = 5 are the same equations. The use of models is essential in helping students eliminate this understanding.
- The use of a symbol to represent a number once cannot be used to represent another number in a different problem/situation. Presenting students with multiple situations in which they select the symbol and explain what it represents will counter this misconception.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply, e.g. they think the attribute they find is length, when it is perimeter.
- Pose problems situations that require students to explain whether they are to find the perimeter or area.
- The use of terms like "round up" and "round down" confuses many students. For example, the number 37 would round to 40 or they say it "rounds up". The digit in the tens place is changed from 3 to 4 (rounds up). This misconception is what causes the problem when applied to rounding down. The number 32 should be rounded (down) to 30, but using the logic mentioned for rounding up, some students may look at the digit in the tens place and take it to the previous number, resulting in the incorrect value of 20. To remedy this misconception, students need to use a number line to visualize the placement of the number and/or ask questions such as: "What tens are 32 between and which one is it closer to?" Developing the understanding of what the answer choices are before rounding can alleviate much of the misconception and confusion related to rounding.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time

- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication

- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 2: Place Value & Problem Solving with Units of Measure*<br><br>**(Approximate Instructional Time: 5 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| ● 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) | MP.1 Make sense of problems and persevere in solving them.<br>MP 2 Reason abstractly and quantitatively.<br>MP.4 Model with mathematics.<br>MP.5 Use appropriate tools strategically. | Concept(s): Time measurement and problem solving.<br><br>Students are able to:<br>● tell time to the nearest minute using digital and analog clocks.<br>● write time to the nearest minute using analog clocks.<br>● choose appropriate strategies to solve real world problems involving time.<br>● Relate skip-counting by 5s to using the number line as a visual model to determine intervals of time as *jumps* on a number line.<br>● measure time intervals.<br><br>**Learning Goal 1:** Tell and write time to the nearest minute, and solve word problems with addition and subtraction involving time intervals in minutes. |
| ● 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. | MP.1 Make sense of problems and persevere in solving them.<br><br>MP 2 Reason abstractly and quantitatively.<br><br>MP.4 Model with mathematics.<br><br>MP.5 Use appropriate tools strategically.<br><br>MP.6 Attend to precision. | Concept(s): Measuring weight and liquid volume in metric units.<br><br>Students are able to:<br>● develop estimation strategies by reasoning about the weight in kilograms of a series of familiar objects to establish mental benchmark measures.<br>● decompose a kilogram to reason about the size and weight of 1 kilogram, 100 grams, 10 grams, and 1 gram.<br>● decompose a liter to reason about the size of 1 liter, 100 milliliters, 10 milliliters, and 1 milliliter.<br>● estimate and measure liquid volume in liters and milliliters using a vertical number line.<br><br>**Learning Goal 2:** Solve one-step and mixed word problems involving all four operations with grams, kilograms, liters and milliliters given in the *same* units. |

| | | |
|---|---|---|
| | | |
| • 3.NBT.A.1. Round whole numbers to the nearest 10 or 100. | MP 2 Reason abstractly and quantitatively. | Concept(s): Rounding to nearest ten and hundred.<br><br>Students are able to:<br>• use vertical number lines to explain rounding numbers to the nearest 10 and 100.<br>• round a whole number to the nearest 10.<br>• round a whole number to the nearest 100.<br>• estimate sums and differences by rounding and apply to solving measurement word problems.<br><br>**Learning Goal 3:** Round whole numbers to the nearest 10 or 100. |
| • 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. *(benchmarked) | MP 2 Reason abstractly and quantitatively. | Concept(s): Two- and three-digit measurement addition & subtraction using the standard algorithm.<br><br>Students are able to:<br>• add and subtract two 2-digit whole numbers within 100 with accuracy and efficiency using the standard algorithm.<br><br>**Learning Goal 4:** Fluently add and subtract (with regrouping) two 2-digit whole numbers within 100. |
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient* | |

| | |
|---|---|
| | *water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |

| | |
|---|---|
| | **SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| District/School Primary and Supplementary Resources | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 2)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities<br>**The pan balance with numbers:**<br>**https://illuminations.nctm.org/Activity.aspx?id=3530**<br><br>**Cute video introduction to the pan balance**<br>**https://nj.pbslearningmedia.org/resource/9ab6618a-a5fd-4716-88d0-6a868a1ba8d9/pan-balance-sid-the-science-kid-games/**<br><br>**Another more "kid friendly" interactive one that they can use on chromebooks**<br>**http://seeingmath.concord.org/case_studies/raw/9d501f6bc748cd26d5218510d234ddfc/lodocs/ma003/01b_activities/divingin/ma003_divingin.htm** |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *Beaker (100 mL and optional 1 liter)*<br>❑ *Beans (e.g., pinto beans, used for making benchmark baggies at different weights)*<br>❑ *Bottles (empty, plastic, labels removed, measuring 2 liters; 1 for every group of 3 students)* | 3.NBT.A.1 Rounding to 50 or 500<br><br>3.NBT.A.1 Rounding to the Nearest Ten and Hundred |

| | |
|---|---|
| ❑ *Clocks (analog and digital)*<br>❑ *Containers (clear plastic, 1 each: cup, pint, quart, gallon)*<br>❑ *Cups (16, clear plastic, with capacity of about 9 oz)*<br>❑ *Cylinder (a slim, cylindrical container whose sides are marked with divisions or units of measure)*<br>❑ *Dropper (for measuring 1 mL)*<br>❑ *Liter-sized container (a container large enough to hold and measure 1 liter)*<br>❑ *Meter strip (e.g., meter stick)*<br>❑ *Pan balance (Online resource available)*<br>❑ *Pitchers (plastic, 1 for each group of 3 students)*<br>❑ *Place value cards (See module overview)*<br>❑ *Place value chart and disks (See module overview)*<br>❑ *Popcorn kernels (30 per student pair)*<br>❑ *Rice (e.g., white rice, used for making benchmark baggies at different weights)* | 3.NBT.A.2, 3.MD.B.3, 3.OA.A.3 Classroom Supplies<br><br>3.MD.A.1 Dajuana's Homework<br><br>3.MD.A.2 How Heavy? |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated math reports | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding* | • **About** (with reference to rounding and estimation, an answer that is not precise)<br>• **Addend** (the numbers that are added together in an addition equation, e.g., in 4 + 5, the numbers 4 and 5 are the addends)<br>• **Capacity** (the amount of liquid that a particular container can hold)<br>• **Continuous** (with reference to time as a continuous measurement)<br>• **Endpoint** (used with rounding on the number line; the numbers that mark the beginning and end of a given interval)<br>• **Gram** (g, unit of measure for weight)<br>• **Interval** (time passed or a segment on the number line) |

| | |
|---|---|
| ❑ *Connect current concepts to previously learned skills* | • **Halfway** (with reference to a number line, the midpoint between two numbers, e.g., 5 is halfway between 0 and 10)<br>• **Kilogram** (kg, unit of measure for mass)<br>• **Liquid volume** (the space a liquid takes up)<br>• **Liter** (L, unit of measure for liquid volume)<br>• **Milliliter** (mL, unit of measure for liquid volume)<br>• **Plot** (locate and label a point on a number line)<br>• **Point** (a specific location on the number line)<br>• **Reasonable** (with reference to how plausible an answer is, e.g., "Is your answer reasonable?")<br>• **Round**(estimate a number to the nearest 10 or 100 using place value)<br>• **Second** (a unit of time)<br>• **Standard algorithm** (for addition and subtraction) ≈ (symbol used to show that an answer is approximate) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- **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.
- **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

**2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

**2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

***Common Misconceptions:***

Using keywords to determine the operation to use instead of using conceptual understanding to determine the operation.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary

- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

| Students at Risk of School Failure |
| --- |

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 3: Multiplication & Division with Units of 0, 1, 6-9, and Multiples of 10*<br><br>**(Approximate Instructional Time: 5 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| ● 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. *(benchmarked) | MP.1 Make sense of problems and persevere in solving them.<br>MP.4 Model with mathematics. | Concept(s): Multiplication and division using units of 6-9.<br><br>Students are able to:<br>● count by units to multiply and divide using number bonds to decompose.<br><br>**Learning Goal 1:** Use multiplication and division within 100 to solve word problems by modeling equal groups or arrays and by writing equations to represent equal groups or arrays |
| ● 3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \div 3$, $6 \times 6 = ?$. | MP 2 Reason abstractly and quantitatively.<br>MP.7 Look for and make use of structure. | Concept(s): Multiplication and division using units of 6-9.<br><br>Students are able to:<br>● interpret the unknown in multiplication and division to model and solve problems.<br><br>**Learning Goal 2:** Determine the unknown in a division or multiplication equation relating whole numbers (within 100). |
| ● 3.OA.B.5. Apply properties of operations as strategies to multiply and divide.<br>*Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of* | MP.3 Construct viable arguments and critique the reasoning of others.<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision.<br>MP.7 Look for and make use of structure. | Concept(s): Using properties of multiplication and division.<br><br>Students are able to:<br>● use the distributive property as a strategy to multiply and divide using units of 6-9.<br>● understand the function of parentheses and apply to solving problems.<br>● model the associative property as a strategy to multiply.<br>● apply the distributive property and the fact 9=10-1 as a strategy to multiply. |

| | | |
|---|---|---|
| *multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 =16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*<br>*[Students need not use the formal terms for these properties.]<br>*[Limit to single digit factors and multipliers. 7 x 4 x 5 would exceed grade 3 expectations because it would result in a two-digit multiplier (28 x 5)] | | **Learning Goal 3:** Multiply one-digit whole numbers by applying the properties of operations (commutative, associative, and distributive properties).<br><br>**Learning Goal 4:** Use tiling and an area model to represent the distributive property. |
| • 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. *(benchmarked) | MP 2 Reason abstractly and quantitatively.<br>MP.7 Look for and make use of structure.<br>MP.8 Look for and express regularity in repeated reasoning. | Concept(s): Multiplication and division using units of 6-9.<br><br>Students are able to:<br>• multiply and divide within 100 with accuracy and efficiency.<br><br>**Learning Goal 5:** Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division. |
| • 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. *(benchmarked) | MP.1 Make sense of problems and persevere in solving them.<br>MP 2 Reason abstractly and quantitatively.<br>MP.3 Construct viable arguments and critique the reasoning of others.<br>MP 4. Model with mathematics<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision. | Concept(s): Multiplication of single digit factors and multiples of 10.<br><br>Students are able to:<br>• represent the solution to two-step word problems with equations.<br>• use a symbol to represent an unknown in an equation.<br>• use rounding as an estimation strategy.<br>• explain, using an estimation strategy, whether an answer is reasonable.<br><br>**Learning Goal 6:** Solve two-step word problems involving multiplying single-digit factors and multiples of 10. |
| • 3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. | MP.3 Construct viable arguments and critique the reasoning of others.<br><br>MP.6 Attend to precision. | Concept(s): Analyze patterns and problem solve with units of 0, 1 and 10.<br>• Addition and multiplication tables reveal arithmetic patterns.<br>• Patterns may be related to whether a number is even or odd.<br>• Patterns exist in rows, columns and diagonals of addition tables and multiplication tables. |

| | | |
|---|---|---|
| *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.* | MP.7 Look for and make use of structure.<br>MP.8 Look for and express regularity in repeated reasoning. | • Decomposing numbers into equal addends may reveal patterns.<br><br>Students are able to:<br>• explain arithmetic patterns using properties of operations.<br>• reason about and explain arithmetic patterns using units of 0 and 1 as they relate to multiplication and division.<br>• identify patterns in multiplication and division facts using the multiplication table.<br>• multiply by multiples of 10 using the place value chart.<br>• use place value strategies when multiplying by multiples of 10.<br><br>**Learning Goal 7:** Recognize arithmetic patterns, including patterns in addition or multiplication tables, and explain the patterns using properties of operations. |
| • 3.NBT.A.3. Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. | MP 2 Reason abstractly and quantitatively. | Concept(s):<br><br>• Multiples of 10 can be represented as a specific number of groups of ten.<br>Students are able to:<br><br>• multiply to determine the total number of groups of ten.<br>• multiply one-digit whole numbers by multiples of 10.<br><br>**Learning Goal 9:** Multiply one digit whole numbers by multiples of 10 (10-90). |
| • 3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as 5 x 7. | MP 2 Reason abstractly and quantitatively.<br>MP.4 Model with mathematics. | Concept(s): Reinforce through the work with 3.OA.A.3, 3.OA.A.4, 3.OA.B.5 3.OA.C.7, 3.OA.D.8, & 3.OA.D.9. |
| • 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 | MP 2 Reason abstractly and quantitatively.<br>MP.4 Model with mathematics. | Concept(s): Reinforce through the work with 3.OA.A.3, 3.OA.A.4, 3.OA.B.5 3.OA.C.7, 3.OA.D.8, & 3.OA.D.9. |

| | | |
|---|---|---|
| when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8. | | |
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** |

| | |
|---|---|
| | **CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

| **District/School Primary and Supplementary Resources** | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 3)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |

| | |
|---|---|
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *Array*<br>❑ *Number bond (model used to show part–part–whole relationships)*<br>❑ *Place vale disks (See module overview)*<br>❑ *Tape diagram (a method for modeling problems)* | 3.OA.A.2 Fish Tanks<br>3.OA.A.3 Two Interpretations of Division<br>3.OA.A.3 Analyzing Word Problems Involving Multiplication<br>3.OA.A.4 Finding the unknown in a division equation<br>3.OA.B.5 Valid Equalities? (Part 2)<br>3.OA.C.7 Kiri's Multiplication Matching Game<br>3.OA.D.8 The Class Trip<br>3.OA.D.9 Addition Patterns<br>3.NBT.A.3 How Many Colored Pencils?<br>3.OA.D.8 The Stamp Collection |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets.<br>• Zearn teacher reports<br>• Star and Accelerated Math programs | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Multiple** (specifically with reference to naming multiples of 9 and 10, e.g., 20, 30, 40, etc.)<br>• **Product** (the quantity resulting from multiplying two or more numbers together) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- **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.
- **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
**2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
**2.NBT.2** Count within 1000; skip-count by 5s, 10s, and 100s.
**3.OA.1** Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.
**3.OA.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. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
**3.OA.6** Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.

***Common Misconceptions:***

- The idea that the smaller the denominator, the smaller the piece or part of the set, or the larger the denominator, the larger the piece or part of the set, is based on the comparison that in whole numbers, the smaller a number, the less it is, or the larger a number, the more it is. The use of different models, such as fraction bars and number lines, allows students to compare unit fractions to reason about their sizes.
- Students think all shapes can be divided the same way. Present shapes other than circles, squares or rectangles to prevent students from overgeneralizing that all shapes can be divided the same way. For example, have students fold a triangle into eighths. Provide oral directions for folding the triangle: 1. Fold the triangle into half by folding the left vertex (at the base of the triangle) over to meet the right vertex. 2. Fold in this manner two more times. 3. Have students label each eighth using fractional notation. Then, have students count the fractional parts in the triangle (one-eighth, two-eighths, three-eighths, and so on).
- Students may read the mark on a scale that is below a designated number on the scale as if it was the next number. For example, a mark that is one mark below 80 grams

may be read as 81 grams. Students realize it is one away from 80, but do not think of it as 79 grams.

- Students forget to label the measurement or choose the incorrect unit.
- Students often focus on size to determine estimates of mass. They can be confused by a big fluffy object and a tiny dense object. Because students cannot tell actual mass until they have handled an object, it is important that teachers do not ask students to estimate the mass of objects until they have had the opportunity to lift the objects and then make an estimate of the mass.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply. They think the attribute they find is length, which is perimeter. Pose problems situations that require students to explain whether they are to find the perimeter or area.
- Students think that when they are presented with a drawing of a rectangle with only two of the side lengths shown or a problem situation with only two of the side lengths provided, these are the only dimensions they should add to find the perimeter. Encourage students to include the appropriate dimensions on the other sides of the rectangle. With problem situations, encourage students to make a drawing to represent the situation in order to find the perimeter.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests

- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 4: Multiplication & Area*<br><br>**(Approximate Instructional Time: 4 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| • 3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.<br>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.<br><br>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. | MP 2 Reason abstractly and quantitatively.<br>MP.4 Model with mathematics.<br>MP.5 Use appropriate tools strategically.<br>MP.7 Look for and make use of structure. | Concept(s): Foundations for understanding area.<br>• Area is the amount of space inside the boundary of a (closed) figure.<br>• 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.<br>• Plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units area can be found by covering a figure with unit squares.<br>• Area of a figure can be determined using unit squares of other dimensions.<br><br>Students are able to:<br><br>• count unit squares in order to measure the area of a figure.<br>• use unit squares of centimeters, meters, inches, feet, and other units to measure area.<br><br>**Learning Goal 1:** Measure areas by counting unit squares ($cm^2$, $m^2$, $in^2$, $ft^2$, and improvised units). |
| • 3.MD.C.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).<br>• 3.MD.C.7. Relate area to the operations of multiplication and addition.<br>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 | MP.4 Model with mathematics.<br><br>MP.5 Use appropriate tools strategically. | Concept(s): Building conceptual understanding of measuring area<br>• Area of a rectangle is found by multiplying the side lengths.<br>• Area of a rectangle may be found by tiling.<br><br>Students are able to:<br>• tile a rectangle with unit squares.<br>• multiply side lengths of a rectangle to find its area and compare the result to that found by tiling the rectangle with unit squares.<br>• solve real world and mathematical problems involving measurement.<br>• represent a rectangular area as the product of whole-numbers. |

| | | |
|---|---|---|
| as would be found by multiplying the side lengths.<br><br>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.<br><br>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 $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.<br><br>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. | | **Learning Goal 2:** Tile a rectangle to find its area and explain the relationship between tiling and multiplying side lengths to find the area of rectangles; solve real world problems by multiplying side lengths to find areas of rectangles. |

| | |
|---|---|
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area. |

| | |
|---|---|
| | **RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| | |
|---|---|
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

| **District/School Primary and Supplementary Resources** | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 4)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *Area model*<br>❑ *Array*<br>❑ *Grid paper (inch and centimeter)*<br>❑ *Rulers (both centimeter and inch measurements)*<br>❑ *Unit squares in both inch and centimeter lengths (e.g., square tiles used for* | 3.MD.C The Square Counting Shortcut<br>3.MD.C.6 Finding the Area of Polygons<br>3.MD.C.7a India's Bathroom Tiles<br>3.MD.C.7c Introducing the Distributive Property |

| | |
|---|---|
| *measuring area—can be made out of paper if plastic or wood tiles are not available)* | 3.MD.C.7d Three Hidden Rectangles |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated Math reports | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Area** (the amount of two-dimensional space in a bounded region)<br>• **Area model** (a model for multiplication that relates rectangular arrays to area)<br>• **Square unit** (a unit of area—specifically square centimeters, inches, feet, and meters)<br>• **Tile** (to cover a region without gaps or overlaps)<br>• **Unit square** (e.g., given a length unit, it is a 1 unit by 1 unit square)<br>• **Whole number** (an integer, i.e., a number without fractions) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- **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.
- **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
**2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
**2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
**2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

***Common Misconceptions:***

- Students may not recognize that measurements can be nearest to the whole inch ie 5 1/16 is closer to 5 inches than it is to 5 ¼ inches.
- Students may not take the key to the graph into account when answering questions.
- Students may not look at the scale of a graph when answering questions.
- Students will struggle process involved in the long division algorithm.
- Students think that when they are presented with a drawing of a rectangle with only two of the side lengths shown or a problem situation with only two of the side lengths provided, these are the only dimensions they should add to find the perimeter. Encourage students to include the appropriate dimensions on the other sides of the rectangle. With problem situations, encourage students to make a drawing to represent the situation in order to find the perimeter.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply. They think the attribute they find is length, which is perimeter. Pose problems situations that require students to explain whether they are to find the perimeter or area.
- Although intervals on a bar graph are not in single units, students count each square as one. To avoid this error, have students include tick marks between each interval. Students should begin each scale with 0. They should think of skip- counting when determining the value of a bar since the scale is not in single units.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work

- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.

- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 5: Fractions as Numbers on the Number Line*<br><br>**(Approximate Instructional Time: 7.5 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| • 3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts having equal area and describe the area of each part as 1/4 of the area of the shape.* | MP 2 Reason abstractly and quantitatively.<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision.<br>MP.7 Look for and make use of structure. | Concept(s): Build conceptual understanding and partitioning a whole into equal parts.<br>• Wholes, when partitioned into equal parts, contain parts representing a unit fraction and each part is the same size.<br>• Each part has the same name and represents a unit fraction (one-half, one-third, one-fourth, one-sixth, one-eighth).<br>• The denominator is the total number of parts in the whole.<br>• The numerator is the number of parts in a given fraction.<br>• Fraction 1/*b* is the quantity formed by 1 part when a whole is partitioned into *b* equal parts.<br>• Fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b* (e.g. 10/2 is 10 parts and each part is of size ½).<br><br>Students are able to:<br>• specify and partition a whole into equal parts, identifying and counting unit fractions using concrete models, paper fraction strips and by drawing pictorial area models.<br><br>**Learning Goal 1:** Represent and identify fractional parts of different wholes. |
| • 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*.<br>*[Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.] | MP 2 Reason abstractly and quantitatively.<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision.<br>MP.7 Look for and make use of structure. | Concept(s): Unit fractions and their relation to the whole.<br>• Wholes, when partitioned into equal parts, contain parts representing a unit fraction and each part is the same size.<br>• Each part has the same name and represents a unit fraction (one-half, one-third, one-fourth, one-sixth, one-eighth).<br>• The denominator is the total number of parts in the whole.<br>• The numerator is the number of parts in a given fraction.<br>• Fraction 1/*b* is the quantity formed by 1 part when a whole is partitioned into *b* equal parts. |

| | | |
|---|---|---|
| | | • Fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b* (e.g. 10/2 is 10 parts and each part is of size ½).<br><br>Students are able to:<br>• partition a whole into equal parts and define the equal parts to identify the unit fraction numerically.<br>• build non-unit fractions less than one whole from unit fractions.<br>• identify and represent shade and non-shaded parts of one whole as fractions.<br>• represent parts of one whole as fractions with number bonds.<br><br>**Learning Goal 2:** Build conceptual understanding and write fractions greater than one whole using unit fractions. |
| • 3.NF.A.3c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*<br>• 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.<br>*[Grade 3 expectations in this domain are limited to fractions with | MP 2 Reason abstractly and quantitatively.<br><br>MP.3 Construct viable arguments and critique the reasoning of others.<br><br>MP.4 Model with mathematics.<br><br>MP.5 Use appropriate tools strategically.<br><br>MP.7 Look for and make use of structure. | Concept(s): Building conceptual understanding of unit fractions and compare, order & size them.<br>• Comparing fractions, each referencing the same *whole*.<br>• Fractions are equivalent if they are the same size.<br>• Fractions are equivalent if they are at the same point on a number line.<br><br>Students are able to:<br>• compare unit fractions by reasoning about their size using fraction strips.<br>• compare unit fractions with different-sized models representing the whole.<br>• specify the corresponding whole when presented with one equal part.<br>• identify a shaded fractional part in different ways depending on the designation of the whole.<br>• compare fractions with the same numerator pictorially<br>• compare fractions with the same numerator using <, >, or =, and use a model to reason about their size.<br><br>**Learning Goal 3:** Compare two fractions with the same numerator or same denominator by reasoning about their size. Compare two fractions having the same numerator; compare two fractions having the same denominator; reason about their size and use the symbols >, =, or < to record the comparison. |

| | | |
|---|---|---|
| denominators 2, 3, 4, 6, and 8.] | | |
| • 3.NF.A.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.<br><br>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.<br><br>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.<br>*[Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.] | MP.5 Use appropriate tools strategically. | Concept(s): Build conceptual understanding of fractions on the number line.<br>• Fraction is a number and has its place on the number line.<br>• When placing unit fractions on a number line, the space between 0 and 1 is the whole and must be partitioned into equal parts.<br>• Each part of a whole has the same size (one-half, one-third, one-fourth, one-sixth or one-eighth).<br>• Parts of the whole that begin at 0 and ends at 1/b on the number line is the location of fraction 1/b (one-half, one-third, one-fourth, one-sixth, or one-eighth).<br><br>Students are able to:<br>• place fractions on a number line with endpoints 0 and 1.<br>• place any fraction on a number line with endpoints 0 and 1.<br>• place whole number fractions and fractions between whole numbers on the number line.<br>• practice placing various fractions on the number line.<br>• partition various wholes precisely into equal parts using a number line method.<br><br>**Learning Goal 4:** Draw a number line depicting the position of 1/b (with b = 2, 3, 4, 6, or 8); represent the unit fraction ¼ on the number line by partitioning the number line between 0 and 1 into 4 equal lengths and name the point at the end of the first length as the position of the unit fraction ¼; apply the same method for placing points 1/2, 1/3, 1/6, and 1/8 on the number line.<br><br>**Learning Goal 5:** Draw a number line depicting the position of fraction *a*/*b* (with *b* = 2, 4, 3, 6, or 8, and including whole numbers up to 5). |
| • 3.NF.A.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size<br><br>• 3.NF.A.3a. Understand two fractions as equivalent (equal) if | MP 2 Reason abstractly and quantitatively.<br><br>MP.3 Construct viable arguments and critique the reasoning of others.<br><br>MP.4 Model with mathematics. | Concept(s): Building conceptual understanding of unit fractions and comparing them.<br>• Comparing fractions, each referencing the same *whole*.<br>• Fractions are equivalent if they are the same size.<br>• Fractions are equivalent if they are at the same point on a number line.<br><br>Students are able to:<br>• recognize and show that equivalent fractions have the same size, though not |

| | | |
|---|---|---|
| they are the same size, or the same point on a number line.<br><br>● 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.<br><br>● 3.NF.A.3c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*<br><br>*[Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.] | MP.5 Use appropriate tools strategically.<br><br>MP.7 Look for and make use of structure. | necessarily the same shape.<br>● recognize and show that equivalent fractions refer to the same point on the number line.<br>● generate simple equivalent fractions by using visual fraction models and the number line.<br>● express whole numbers as fractions and recognize equivalence with different units.<br>● express whole numbers on the number line when the unit interval is 1.<br>● explain equivalence by manipulating units and reasoning about their size.<br><br>**Learning Goal 6:** Generate simple equivalent fractions, explain why they are equivalent, and support the explanation with visual fraction models; locate them on the number line.<br>**Learning Goal 7:** Express whole numbers as fractions, identify fractions equivalent to whole numbers and locate them on the number line. |
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)* | |

| | |
|---|---|
| | **3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly. |

| | |
|---|---|
| | A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| District/School Primary and Supplementary Resources | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 5)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *1 m length of yarn*<br>❑ *12" × 1" strips of yellow construction paper*<br>❑ *1-liter beaker (optional)*<br>❑ *2" × 6" strips of brown construction paper*<br>❑ *200 g ball of clay or play dough*<br>❑ *4& 1/4 " × 1" paper strips*<br>❑ *4" × 4" orange squares*<br>❑ *Arrays*<br>❑ *Clear plastic cups*<br>❑ *Concrete fraction models (e.g., water, string, clay)*<br>❑ *Food coloring (to color water)*<br>❑ *Fraction strips (made from paper, used to fold and model parts of a whole. See example in module overview.)*<br>❑ *Number line*<br>❑ *Pictorial fraction model (e.g., drawing of a circle or square)*<br>❑ *Rectangular- and circular-shaped paper* | 3.G.A.2 Representing Half of a Circle<br><br>3.NF.A.1 Naming the Whole for a Fraction<br><br>3.NF.A.2 Closest to 1/2<br><br>3.NF.A.2 Find 1 Starting from 5/3<br><br>3.NF.A.2 Locating Fractions Greater than One on the Number Line<br><br>3.NF.A.3b, 3.G.A.2, 3.MD.C.6 Halves, thirds, and sixths |

| | |
|---|---|
| ❑ *Rulers*<br>❑ *Sets of <, >, = cards*<br>❑ *Shapes partitioned into fractional parts*<br>❑ *Tape diagram* | |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated math reports | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Copies** (refers to the number of unit fractions in 1 whole)<br>• **Equivalent fractions** (fractions that name the same size or the same point on the number line)<br>• **Fractional unit** (half, third, fourth, etc.)<br>• **Non-unit fraction** (fraction with numerator other than 1)<br>• **Unit fraction** (fraction with numerator 1)<br>• **Unit interval** (the interval from 0 to 1, measured by length) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- **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.
- **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

**2.G.3** 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., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

***Common Misconceptions:***

- Students may not recognize that measurements can be nearest to the whole inch ie 5 1/16 is closer to 5 inches than it is to 5 ¼ inches.
- Students may not take the key to the graph into account when answering questions.
- Students may not look at the scale of a graph when answering questions.
- Students will struggle process involved in the long division algorithm.
- Students think that when they are presented with a drawing of a rectangle with only two of the side lengths shown or a problem situation with only two of the side lengths provided, these are the only dimensions they should add to find the perimeter. Encourage students to include the appropriate dimensions on the other sides of the rectangle. With problem situations, encourage students to make a drawing to represent the situation in order to find the perimeter.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply. They think the attribute they find is length, which is perimeter. Pose problems situations that require students to explain whether they are to find the perimeter or area.
- Although intervals on a bar graph are not in single units, students count each square as one. To avoid this error, have students include tick marks between each interval. Students should begin each scale with 0. They should think of skip- counting when determining the value of a bar since the scale is not in single units.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher

- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.

- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 6: Collecting & Displaying Data*<br><br>**(Approximate Instructional Time: 2 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| • 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. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.* | MP.1 Make sense of problems and persevere in solving them.<br><br>MP 2 Reason abstractly and quantitatively.<br>MP.4 Model with mathematics. | Concept(s): Generate & analyze categorical data<br><br>Students are able to:<br>• generate and organize data<br>• rotate tape diagrams vertically<br>• create scaled bar graphs<br>• solve one- and two-step problems involving graphs.<br><br>**Learning Goal 1:** Draw scaled picture and scaled bar graphs to represent data with several categories. Solve one and two-step word problems using 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. | MP 2 Reason abstractly and quantitatively.<br><br>MP.5 Use appropriate tools strategically. | Concept(s): Generate & analyze measurement data<br><br>Students are able to:<br>• measure length using rulers marked with inch, quarter inch and half inch intervals<br>• generate measurement data by measuring length and create a line plot of the data<br>• accurately measure several small objects using a standard ruler and display findings on a line plot<br>• display data on line plots with horizontal scales in whole numbers, halves, and quarters<br><br>**Learning Goal 2:** Depict data measured in fourths and halves of an inch with a line plot with scales marked with appropriate units |
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)* | |

| | |
|---|---|
| | **3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) |

| | |
|---|---|
| | **W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. |

| | |
|---|---|
| | **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

| **District/School Primary and Supplementary Resources** | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 6)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *Bar graph*<br>❑ *Grid paper*<br>❑ *Line plot*<br>❑ *Picture graph*<br>❑ *Rulers (measuring in inches, half inches, and quarter inches)*<br>❑ *Sentence strips*<br>❑ *Tape diagram* | 3.MD.B.3 Classroom Supplies |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities. | • Teacher created assessments and projects |

| | |
|---|---|
| • Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated math reports | • ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Frequent** (most common measurement on a line plot)<br>• **Key** (notation on a graph explaining the value of a unit)<br>• **Measurement data** (e.g., length measurements of a collection of pencils)<br>• **Scaled graphs** (bar or picture graph in which the scale uses units with a value greater than 1) |

**Focus Mathematical Concepts**

***Grade Level Fluency Requirement:***

- **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.
- **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3).

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

**2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

**2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

**2.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems[1] using information presented in a bar graph

Common Misconceptions:

- Students may not recognize that measurements can be nearest to the whole inch ie 5 1/16 is closer to 5 inches than it is to 5 ¼ inches.
- Students may not take the key to the graph into account when answering questions.
- Students may not look at the scale of a graph when answering questions.
- Students will struggle process involved in the long division algorithm.
- Students think that when they are presented with a drawing of a rectangle with only two of the side lengths shown or a problem situation with only two of the side lengths provided, these are the only dimensions they should add to find the perimeter. Encourage students to include the appropriate dimensions on the other sides of the rectangle. With problem situations, encourage students to make a drawing to represent the situation in order to find the perimeter.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply. They think the attribute they find is length, which is perimeter. Pose problems situations that require students to explain whether they are to find the perimeter or area.
- Although intervals on a bar graph are not in single units, students count each square as one. To avoid this error, have students include tick marks between each interval. Students should begin each scale with 0. They should think of skip- counting when determining the value of a bar since the scale is not in single units.

| **Differentiation/Accommodations/Modifications** |
| --- |
| Gifted and Talented |
| (content, process, product and learning environment)<br><br>**Extension Activities**<br>● Conduct research and provide presentation of various topics. |

- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments
- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.

- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work

- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

# Green Township School District Grade 3 Mathematics Curriculum - Revised 2017

| *Unit 7: Geometry & Measurement Word Problems*<br><br>**(Approximate Instructional Time: 8 weeks)** | | |
|---|---|---|
| **NJ Student Learning Standards** | **Suggested Standards for Mathematical Practice** | **Critical Knowledge & Skills**<br><br>***(Learning goals are for the Unit but may not necessarily be in sequential order.)*** |
| ● 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. *(benchmarked) | MP.1 Make sense of problems and persevere in solving them.<br>MP 2 Reason abstractly and quantitatively.<br>MP.3 Construct viable arguments and critique the reasoning of others.<br>MP 4. Model with mathematics<br>MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision. | Concept(s): Solving word problems.<br><br>Students are able to:<br>● represent the solution to two-step word problems with equations.<br>● use a symbol to represent an unknown in an equation.<br><br>**Learning Goal 1:** Solve word problems in varied contexts using a letter to represent the unknown; share and critique peer solution strategies to varied word problems. |
| ● 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. | MP.5 Use appropriate tools strategically.<br>MP.6 Attend to precision.<br>MP.7 Look for and make use of structure. | Concept(s): Attributes of two-dimensional figures<br><br>Students are able to:<br>● compare and classify quadrilaterals and other polygons.<br>● draw polygons with special attributes to solve problems.<br>● reason about composing and decomposing polygons using tetrominoes.<br>● create a tangram puzzle and observe the relationships among the shapes.<br>● reason about composing and decomposing polygons using tangrams.<br><br>**Learning Goal 2:** Use reasoning to build conceptual understanding of two-dimensional shapes. |
| ● 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 | MP.1 Make sense of problems and persevere in solving them.<br><br>MP 2 Reason abstractly and quantitatively. | Concept(s): Problem solving with perimeter<br>● Perimeter of a figure is equivalent to the sum of the length of all of the sides.<br>● Rectangles that have same perimeter can have different areas.<br>● Rectangles that have same area can have different perimeters |

| | | |
|---|---|---|
| and different areas or with the same area and different perimeters. | MP.4 Model with mathematics.<br><br>MP.5 Use appropriate tools strategically. | Students are able to:<br>● determine the perimeter of various plane shapes and irregular shapes given the side lengths.<br>● determine the unknown side length give the perimeter and other sides.<br>● show rectangles having the same perimeter and different areas.<br>● show rectangles having different perimeters and the same area.<br><br>**Learning Goal 3:** 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.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. | MP 2 Reason abstractly and quantitatively.<br><br>MP.5 Use appropriate tools strategically. | Concept(s): Perimeter and area data on line plots<br><br>Students are able to:<br>● use a line plot to record the number of rectangles constructed from a given number of unit squares and area concepts.<br><br>**Learning Goal 4:** Depict data measured in fourths and halves of an inch with a line plot with scales marked with appropriate units |
| **Interdisciplinary Connections:**<br><br>**NGSS Appendix for Alignment** | ***Science:***<br>**3-PS2 As part of this work, teachers should give students opportunities to work with continuous quantities:** *Science example: Estimate, then measure, the masses of two objects being used in an investigation of the effect of forces; observe that the change of motion due to an unbalanced force is larger for the smaller mass (students need not explain or quantify this observation in terms of Newton's laws of motion). (3.MD.A.2)*<br>**3-LS1 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:** *Science example: Be quantitative when describing the life cycles of organisms, such as their varying lifespans (e.g., ranging from a fraction of a year up to thousands of years) and their varying reproduction (e.g., ranging from a handful of offspring to thousands). (3.NF and 3.NBT)*<br>**3-LS2 As part of this work, teachers should give students opportunities to be quantitative in giving descriptions:***Science example: Be quantitative when describing the group behaviors of animals (e.g., describe groups ranging in size from a handful up to thousands of animals). (3.NBT)*<br>**3-LS3 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Make a line plot to show the height of each of a number of plants grown from a single parent. Observe that not all of the offspring are the same size. Compare the sizes of the offspring to the size of the parent. (2) Make a similar plot for plants grown with insufficient water. (3.MD.B.4)*<br>**3-LS4 As part of this work, teachers should give students opportunities to represent and interpret data:** *Science examples: (1) Given a bar graph showing the number of flower species that were found in several different habitats, determine how many more flower* | |

| | |
|---|---|
| | *species were found in grassy meadow than were found in dense forest. Would flower species be affected if a forest were to spread into its habitat? (2) Make a scaled bar graph to show the number of surviving individuals with and without an advantageous trait. How many more of the individuals with the advantageous trait survived?*<br>*(3) Make a line plot to show the length of each fossil that is visible in a piece of shale. Do any of the fossils resemble modern organisms except for their size? (3.MD.B.3, 3.MD.B.4)*<br>**3-ESS2 As part of this work, teachers should give students opportunities to work with continuous quantities and represent and interpret categorical data:** *Science examples: (1) Estimate the mass of a large hailstone that damaged a car on a used-car lot. (2) Measure the volume of water in liters collected during a rainstorm.(2) Make a picture graph or bar graph to show the number of days with high temperature below freezing in December, January, February, and March. How many days were below freezing this winter? (3.MD.A.2, 3.MD.B.3)*<br>**3-ESS3 As part of this work, teachers should give students opportunities to work with continuous quantities including area:***Science example: In Hawaii, some houses are raised on stilts to reduce the impact of a tsunami. The force of the tsunami on an object is greater if the object presents greater area to the incoming wave. Based on a diagram of a stilt house, determine how much area the stilts present to an incoming wave. How much area would the house present to an incoming wave if it were not on stilts? (3.MD.A.2, 3.MD.C.5, 3.MD.C.6)*<br>***English-Language Arts:***<br>**RI.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.<br>**RI.3.2.** Determine the main idea of a text; recount the key details and explain how they support the main idea.<br>**RI.3.3.** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br>**RI.3.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br>**RI.3.5.** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently<br>**RI.3.7.** Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).<br>**RI.3.8.** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)<br>**W.3.2**. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.<br>A. Introduce a topic and group related information together; include text features (e.g.: illustrations, diagrams, captions) when useful to support comprehension.<br>B. Develop the topic with facts, definitions, and details.<br>C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.<br>D. Provide a conclusion.<br>W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**SL.3.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.<br>A. Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.<br>B. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a |

| | |
|---|---|
| | time about the topics and texts under discussion).<br>C. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. D. Explain their own ideas and understanding in light of the discussion.<br>**SL.3.3**. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.<br>**SL.3.4**. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.<br>**SL.3.5.** Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.<br>**SL.3.6.** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| **21st Century Skills/ Career Ready Practices:** | **CRP1. Act as a responsible and contributing citizen and employee.**<br>**CRP2. Apply appropriate academic and technical skills.**<br>**CRP3. Attend to personal health and financial well-being.**<br>**CRP4. Communicate clearly and effectively and with reason.**<br>**CRP5. Consider the environmental, social and economic impacts of decisions.**<br>**CRP6. Demonstrate creativity and innovation.**<br>**CRP7. Employ valid and reliable research strategies.**<br>**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**CRP9. Model integrity, ethical leadership and effective management.**<br>**CRP10. Plan education and career paths aligned to personal goals.**<br>**CRP11. Use technology to enhance productivity.**<br>**CRP12. Work productively in teams while using cultural global competence.** |
| **2014 NJ Technology Standards:** | **8.1 Educational Technology** (Word \| PDF)<br>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.<br><br>**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**<br>(Word \| PDF)<br>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.<br><br>Please see relevant projects for technology standards 8.1 and 8.2: |

| District/School Primary and Supplementary Resources | |
|---|---|
| **Primary Resource:**<br><br>**Eureka Math (Unbound Ed - Module 7)**<br><br>**Zearn.org** | Number Talks: Building Numerical Reasoning<br>Sadlier Progress In Mathematics Online Resources - Grade 3<br>***Sadlier Progress in Mathematics*** Workbook<br>***Excel Math*** (Publisher: AnsMar)<br>***First In Math***<br>Khan Academy<br>Visual Patterns: Gr. K-12<br>Number Strings<br>Common Core Progression Documents<br>**Performance Tasks are available for use from the following sites:**<br>Illustrative Mathematics<br>Coherence Map<br>Inside Mathematics Problems of the Month<br>Grade 3 YouCubed Tasks<br>Additional Fluency & Lesson Activities |
| **Suggested Materials & Tools:** | **Suggested Tasks for Use During Unit** |
| ❑ *Cardstock (for making student copies of templates)*<br>❑ *Grid paper*<br>❑ *Pattern Blocks*<br>❑ *Rulers (measuring to the nearest quarter inch, constructed by students in Module* | 3.OA.D.8 The Class Trip |

| | |
|---|---|
| *6)*<br>❑ *String*<br>❑ *Tangrams (see example illustrated in overview)*<br>❑ *Tetrominoes (see example illustrated in overview)* | |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| • Teacher observation of students engaged in group and independent activities.<br>• Individual and small group conferences/interviews to assess understanding with rubric<br>• Sprints<br>• Self-assessment by students with guidance from teacher.<br>• Exit tickets<br>• Zearn teacher reports<br>• Star and Accelerated math reports | • Teacher created assessments and projects<br>• ***Sadlier*** Unit Assessments<br>• ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)<br>• Teacher/District created benchmark assessments |
| **Instructional Best Practices and Exemplars** | **Mathematical Terms/Vocabulary** |
| ❑ *Math Work Stations*<br>❑ *Use Communicators/manipulatives*<br>❑ *Number talks*<br>❑ *Hands-on activities*<br>❑ *Exploratory activities*<br>❑ *Games/play*<br>❑ *Using concrete materials to advance conceptual understanding*<br>❑ *Use drawings and diagrams to advance conceptual understanding*<br>❑ *Connect current concepts to previously learned skills* | • **Attribute** (any characteristic of a shape, including properties and other defining characteristics, e.g., straight sides, and non-defining characteristics, e.g., blue)<br>• **Diagonal** (e.g., the line drawn between opposite corners of a quadrilateral)<br>• **Perimeter** (boundary or length of the boundary of a two-dimensional shape)<br>• **Property** (e.g., having all sides equal in length)<br>• **Regular polygon** (polygon whose side lengths and interior angles are all equal)<br>• **Tessellate** (to tile a plane without gaps or overlaps)<br>• **Tetrominoes** (four squares arranged to form a shape so that every square shares at least one side with another square) |
| **Focus Mathematical Concepts** | |
| ***Grade Level Fluency Requirement:***<br><br>❖ **3.OA.C.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.<br>❖ **3.NBT.A.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.Single-digit products and quotients (Products from memory by end of Grade 3). | |

***Prerequisite skills***

***Refer to Achieve the Core Coherence Map for full detail on vertical and horizontal alignment to prerequisite skills & future skills.***

**Coherence Map**

**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
**2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.
**2.G.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. (Sizes are compared directly or visually, not compared by measuring.)
**3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement:
a. 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.
b. 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.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
**3.MD.7** Relate area to the operations of multiplication and addition.
a. 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.
b. 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.
c. 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 $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
d. Recognize area as additive. Find the 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.

***Common Misconceptions:***

- Students may not recognize that measurements can be nearest to the whole inch, e.g. 5& 1/16 is closer to 5 inches than it is to 5 ¼ inches.
- Students may not take the key to the graph into account when answering questions.
- Students may not look at the scale of a graph when answering questions.
- Students will struggle process involved in the long division algorithm.
- Students think that when they are presented with a drawing of a rectangle with only two of the side lengths shown or a problem situation with only two of the side lengths provided, these are the only dimensions they should add to find the perimeter. Encourage students to include the appropriate dimensions on the other sides of the rectangle. With problem situations, encourage students to make a drawing to represent the situation in order to find the perimeter.
- Students may confuse perimeter and area when they measure the sides of a rectangle and then multiply. They think the attribute they find is length, which is perimeter. Pose problems situations that require students to explain whether they are to find the perimeter or area.
- Although intervals on a bar graph are not in single units, students count each square as one. To avoid this error, have students include tick marks between each interval. Students should begin each scale with 0. They should think of skip- counting when determining the value of a bar since the scale is not in single units.

**Differentiation/Accommodations/Modifications**

Gifted and Talented

(content, process, product and learning environment)

**Extension Activities**

- Conduct research and provide presentation of various topics.
- Design surveys to generate and analyze data to be used in discussion.
- Debate topics of interest / cultural importance.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts.
- Exploration of art and/or artists to understand society and history.
- Implement RAFT Activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Anchor Activities**

- Use of Higher Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice.
- Model skills/techniques that need to be mastered.
- Extended time to complete class work
- Visual dictionaries to help build vocabulary
- Provide copy of classnotes
- Pair with a peer for assistance during class

**Modifications for Homework/Assignments**

- Modified Assignments

- Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities

(**appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team**)

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions

- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.

Students at Risk of School Failure

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Repetition and practice
- Model skills / techniques to be mastered.
- Extended time to complete class work
- Provide copy of classnotes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments.
- Establish expectations for correct spelling on assignments.
- Extra textbooks for home.
- Student may request books on tape / CD / digital media, as available and appropriate.
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/ school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

**Modifications for Homework and Assignments**

- Extended time to complete assignments.
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT activities as they pertain to the types / modes of communication (role, audience, format, topic).

**Modifications for Assessments**

- Extended time on classroom tests and quizzes.
- Student may take/complete tests in an alternate setting as needed.
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests.
- Establish procedures for accommodations / modifications for assessments.