Green Township School District Grade 4 Mathematics Curriculum - Revised 2017

Unit 1: Place Value, Rounding & Algorithms for Addition & Subtraction **(Approximate Instructional Time: 5 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
• 4.NBT.A.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure.	Concept(s): Place value of multi-digit whole numbers Students are able to: • interpret a multiplication equation as a comparison. • recognize a digit represents 10 times the value of what it represents in the place to its right. **Learning Goal 1:** For a whole number up to one million, explain that a digit in one place represents ten times what it would represent in the place to its right.
• 4.NBT.A.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure.	Concept(s): Comparing multi-digit whole numbers Students are able to: • name numbers within 1 million by building understanding of the place value chart and placement of commas for naming base thousand units • read and write multi-digit whole numbers using base-ten numerals, number names and expanded form. • compare two multi-digit numbers based on meanings of using >, =, and < symbols. **Learning Goal 2:** Compare two multi-digit whole numbers (up to one million) using >, =, and < for numbers presented as base ten numerals, number names, and/or in expanded form.

• 4.NBT.A.3. Use place value understanding to round multi-digit whole numbers to any place. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure.	Concept(s): Rounding multi-digit whole numbers Students are able to: • round multi-digit numbers to the thousands place using the vertical number line. • round multi-digit numbers to any place using the vertical number line. • use place value understanding to round multi-digit numbers to any place value. • use place value understanding to round multi-digit numbers to any place value using real world applications. **Learning Goal 3:** Round multi-digit whole numbers up to one million to any place. **Learning Goal 4:** Solve multi-step word problems modeled with tape diagrams, and assess the reasonableness of answers using rounding.
• 4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *(benchmarked)	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	Concept(s): Multi-digit whole number addition & subtraction • Proper use of the equal sign • ***Improper use of the equal sign (e.g. 3 + 7 = 10 – 5 = 5 is incorrect)*** Students are able to: • solve multi-step word problems involving any of the four operations. • solve multi-step word problems involving interpretation (in context) of a remainder. • write equations to represent multi-step word problems, using a letter to represent the unknown quantity. • explain why an answer is reasonable. • use mental computation and estimation strategies to determine whether an answer is reasonable. **Learning Goal 5:** Solve two-step word problems using the standard algorithm fluently modeled with tape diagrams, and assess the reasonableness of answers using rounding. Create and solve multi-step word problems from given tape diagrams and equations.

• 4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.] *(benchmarked)	MP.7 Look for and make use of structure.	Concept(s): Multi-digit whole number addition & subtraction. Students are able to: • add using the standard algorithm with accuracy and efficiency. • subtract using the standard algorithm with accuracy and efficiency. **Learning Goal 6**:Use place value understanding to fluently add multi-digit whole numbers using the standard addition algorithm, and apply the algorithm to solve word problems using tape diagrams. **Learning Goal 7**:Use place value understanding to fluently decompose to smaller units multiple times in any place using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams.
• 4.OA.A.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics.	Concept(s): Reinforce through work with 4.NBT.A.1 AND 4.NBT.A.2
Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.G.A.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not*	

	expected until Grade 5. **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1****. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2****. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3****. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4****. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7****. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.*** *Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.* *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).* *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4****. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5****. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7****. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.*** *Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1****. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the*

	discussion and link to the remarks of others. *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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** (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 1)**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook

Zearn.org	***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Tools & Representations:	**Suggested Tasks for Use During Unit**
❑ *Number lines (vertical to represent rounding up and rounding down)* ❑ *Personal white boards (one per student; see explanation in module overview)* ❑ *Place value cards (one large set per classroom including 7 units to model place value)* ❑ *Place value chart (templates provided in lessons to insert into personal white boards)* ❑ *Place value disks (can be concrete manipulatives or pictorial drawings, such as the chip model, to represent numbers)* ❑ *Tape diagrams (drawn to model a word problem)*	4.NBT.A.1 Thousands and Millions of Fourth Graders 4.NBT.A.2 Ordering 4-digit numbers 4.NBT.A.3 Rounding on the Number Line 4.NBT.B To regroup or not to regroup 4.OA.A.3 Carnival Tickets
District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric)

• Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Ten thousands, hundred thousands** (as places on the place value chart) • **Millions, ten millions, hundred millions** (as places on the place value chart) • **Variable** (letters that stand for numbers and can be added, subtracted, multiplied, and divided as numbers are)

Focus Mathematical Concepts

Grade Level Fluency Requirement:

❖ **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

Prerequisite skills

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

Coherence Map

3.OA.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. [1]
3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.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.

Common Misconceptions:

- Confusion between factors and multiples
- Confusion between prime and composite

- Students will need to be reminded to divide when going from smaller to bigger units and multiply when going from bigger to smaller units
- When listing multiples of numbers, students may not list the number itself. Emphasize that the smallest multiple is the number itself. Some students may think that larger numbers have more factors. Having students share all factor pairs and how they found them will clear up this misconception.
- There are several misconceptions students may have about writing numerals from verbal descriptions. Numbers like one thousand do not cause a problem; however a number like one thousand two causes problems for students. Many students will understand the 1000 and the 2 but then instead of placing the 2 in the ones place, students will write the numbers as they hear them, 10002 (ten thousand two). There are multiple strategies that can be used to assist with this concept, including place-value boxes and vertical-addition method.
- Students often assume that the first digit of a multi-digit number indicates the "greatness" of a number. The assumption is made that 954 is greater than 1002 because students are focusing on the first digit instead of the number as a whole.

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.

Unit 2: Unit Value and Problem Solving with Metric Measurement **(Approximate Instructional Time: 9 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
• 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36).*	MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Metric unit conversions and applications. • ***Build conceptual understanding of relative sizes*** of measurements (e.g. a kilometer is 1000 times as long as a meter and 100,000 times as long as a centimeter). Students are able to: • express metric length, mass and capacity measurements in terms of a smaller unit. • know and relate metric units to place value units in order to express measurements in different units. • generate a two-column table to record measurement equivalents. **Learning Goal 1:** Express measurement in a larger unit in terms of a smaller unit and record equivalent measures in a two-column table.
• 4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Metric unit conversions and applications Students are able to: • model and solve word problems (using addition, subtraction and multiplication) involving metric length, mass and capacity, including problems involving simple fractions or decimals. • construct diagrams (e.g. number line diagrams) to represent measurement quantities. **Learning Goal 2:** Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms

		of a smaller unit).
Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.*

	B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic. *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).* *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4**. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5**. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7**. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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** (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 2)** ***Note: Module 2 title is incorrect on UnboundEd but it is the correct link*** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *Balance scale, weights (masses)* ❑ *Centimeter ruler, meter stick* ❑ *Liter containers with millimeter scale* ❑ *Number line*	4.MD.A.1 Who is the tallest? 4.MD.A.2 Margie Buys Apples

❑ *Tape diagram* ❑ *Two-column table*	
District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Convert** (express a measurement in a different unit; rename units) • **Kilometer** (km, a unit of measure for length) • **Mass** (the measure of the amount of matter in an object) • **Milliliter** (mL, a unit of measure for liquid volume) • **Mixed units** (e.g., 3 m 43 cm)

Focus Mathematical Concepts

Grade Level Fluency Requirement:

❖ **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

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.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the

following as special case:

a. 100 can be thought of as a bundle of ten tens—called a "hundred."

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.

3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems, i.e., problems involving notions of "times as much.")

4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Common Misconceptions:

- When multiplying multi digit numbers students will often to forget to bring down the zero when multiplying the tens place..
- When doing multiplication which requires regrouping students will often reverse the digits. Ie 54 X 9 students will often correctly compute 9x4 as 36 but put the 3 in the ones place of the product and place the 6 above the 5 to be added to the product of 9x5.
- Students will struggle with division algorithm and often make errors in bringing numbers down and placing the number that should go in quotient into the subtraction portion of the algorithm.
- Students confuse LCM and GCF
- When finding equivalent fractions students often forget to multiply the numerator ad denominator by the same number.
- Students think that when generating equivalent fractions they need to multiply or divide either the numerator or denominator, such as, changing 1/2 to sixths. They would multiply the denominator by 3 to get 1/6, instead of multiplying the numerator by 3 also. Their focus is only on the multiple of the denominator, not the whole fraction. It's important that students use a fraction in the form of one such as 3/3 so that the numerator and denominator do not contain the original numerator or denominator.
- Given only length and width students will often forget to include the missing sides in perimeter calculations.

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.

Unit 3: Multi-digit Multiplication and Division **(Approximate Instructional Time: 4 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
● 4.OA.A.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics.	Concept(s): Multiplicative comparison & multiplication word problems ● Multiplication equations represent comparisons. Students are able to: ● explain multiplication equations as comparisons. ● write multiplication equations given word problems indicating multiplicative comparison. ● solve and demonstrate understanding multiplicative comparison word problems by applying the area and perimeter formulas. **Learning Goal 1:** Write multiplication equations from word problems indicating multiplicative comparisons and describe multiplication equations as comparisons.
● 4.OA.A.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Multiplicative comparison & multiplication word problems Students are able to: ● multiply to solve word problems involving multiplicative comparison. ● divide to solve word problems involving multiplicative comparison. ● represent problems with drawings and equations, using a symbol for the unknown number. ● distinguish word problems involving multiplicative comparison from those involving additive comparison. **Learning Goal 2:** Solve two-step word problems, including multiplicative comparison. **Learning Goal 3:** Use multiplication, addition, or subtraction to solve multi-step word problems.

• 4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *(benchmarked)	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	Concept(s): Division of Thousands, Hundreds, Tens and Ones Students are able to: • solve multi-step word problems involving any of the four operations. • solve multi-step word problems involving interpretation (in context) of a remainder. • write equations to represent multi-step word problems, using a letter to represent the unknown quantity. • explain why an answer is reasonable. • use mental computation and estimation strategies to determine whether an answer is reasonable. **Learning Goal 4:** Write and solve each equation (including any of the four operations) in order to solve multi-step word problems, using a letter to represent the unknown; interpret remainders in context and assess the reasonableness of answers using mental computation with estimation strategies.
• 4.NBT.B.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Division of Tens & ones with successive remainders; division of thousands, hundreds, tens and ones. Students are able to: • find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value, the properties of operations, and the relationship between multiplication and division. • represent these operations with equations, rectangular arrays, and area models. • explain remainders by using place value understanding and models. • solve division problems with and without remainders using the area model. • explain the connection of the area model of division to the long division algorithm for three- and four-digit dividends. **Learning Goal 5:** Divide a whole number of up to four-digits by a one-digit divisor; represent and explain the calculation using equations, rectangular arrays, and area models.

• 4.OA.B.4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Reasoning with divisibility • *Whole numbers are a multiple of each of its factors.* • *Prime numbers do not have factors other than 1 and the number itself.* Students are able to: • find all factor pairs for any whole number (between 1 and 100) and use understanding of factors to define prime and composite. • use division and the associative property to test for factors and observe patterns. • given a one-digit number, determine whether a given whole number (between 1 and 100) is a multiple of the one-digit number. • explore properties of prime and composite numbers to 100 by using multiples. **Learning Goal 6:** Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number and whether it is prime or composite.
• 4.NBT.B.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure.	Concept(s): Multiplication of two-digit by two-digit numbers Students are able to: • multiply two-digit multiples of 10 by two-digit numbers using a place value chart, area model, partial products and the standard algorithm. **Learning Goal 7:** Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers; represent and explain calculations using equations, rectangular arrays, and area models.
• 4.MD.A.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems.		Concept(s): Reinforce through the work with 4.OA.A.3 and 4.NBT.5

Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.* *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).*

	D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented. ***W.4.4**. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5**. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7**. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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 (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 3)** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *Area model* ❑ *Grid paper* ❑ *Number bond* ❑ *Place value disks: suggested minimum of 1 set per pair of students (18 ones, 18 tens, 18 hundreds, 18 thousands, 1 ten thousand)* ❑ *Tape diagram* ❑ *Ten thousands place value chart (Lesson 7 Template)* ❑ *Thousands place value chart (Lesson 4 Template)*	4.OA.A.2 Comparing Money Raised 4.OA.A.3 Carnival Tickets 4.OA.A.3, 4.MD.A.3 Karl's Garden 4.OA.B Identifying Multiples 4.OA.B Numbers in a Multiplication Table 4.NBT.A.1 Thousands and Millions of Fourth Graders 4.NBT.B To regroup or not to regroup 4.NBT.B.6 mental Division Strategy

Green Township School District Grade 4 Mathematics Curriculum - Revised 2017

District/School Formative Assessment Plan	District/School Summative Assessment Plan
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Associative property** (e.g., $96 = 3 \times (4 \times 8) = (3 \times 4) \times 8$) • **Composite number** (positive integer having three or more whole number factors) • **Distributive property** (e.g., $64 \times 27 = (60 \times 20) + (60 \times 7) + (4 \times 20) + (4 \times 7)$) • **Divisible** • **Divisor** (the number by which another number is divided) Formula (a mathematical rule expressed as an equation with numbers and/or variables) • **Long division** (process of dividing a large dividend using several recorded steps) • **Partial product** (e.g., $24 \times 6 = (20 \times 6) + (4 \times 6) = 120 + 24$) • **Prime number** (positive integer greater than 1 having whole number factors of only 1 and itself) • **Remainder** (the number left over when one integer is divided by another)

Focus Mathematical Concepts

Grade Level Fluency Requirement:

❖ **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

Prerequisite skills

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

Coherence Map

3.OA.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. (See CCLS Glossary, Table 2.)

3.OA.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 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?.*

3.OA.5 Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of 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.)*

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.*

3.OA.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.OA.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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)

3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

3.MD.7 Relate area to the operations of multiplication and addition.

3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Common Misconceptions:

- Students confuse LCM and GCF
- When finding equivalent fractions students often forget to multiply the numerator ad denominator by the same number.
- Students think that when generating equivalent fractions they need to multiply or divide either the numerator or denominator, such as, changing 1/2 to sixths. They would multiply the denominator by 3 to get 1/6, instead of multiplying the numerator by 3 also. Their focus is only on the multiple of the denominator, not the whole fraction. It's important that students use a fraction in the form of one such as 3/3 so that the numerator and denominator do not contain the original numerator or denominator.
- Students use whole-number names when counting fractional parts on a number line. The fraction name should be used instead. For example, if two-fourths is represented on the line plot three times, then there would be six-fourths.
- Students also count the tick marks on the number line to determine the fraction, rather than looking at the distance or space between the marks.

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.

Unit 4: Angle Measure and Plane Figures **(Approximate Instructional Time: 5 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
● 4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s):Lines and angles Students are able to: ● identify and draw points, lines, line segments and rays. ● draw angles (right, acute, obtuse). ● identify, define and draw perpendicular and parallel lines. ● distinguish between lines, line segments, and rays. ● identify points, lines, line segment, rays, right angles, acute angles, obtuse angles, perpendicular lines and parallel lines in two-dimensional figures. **Learning Goal 1:** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and identify these in two-dimensional figures.
● 4.MD.C.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	MP.2 Reason abstractly and quantitatively.	Concept(s): Angle measurement ● Angles are formed by two rays sharing a common endpoint and result from the rotation of one ray around the endpoint. ● Angle Measurement: An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. Students are able to: ● describe an angle as measured with reference to a circle with the center of the circle being the common endpoint of the rays. ● explain a ‘one-degree angle’ and its relation to a circle; a “degree” is defined as 1/360 (one degree angle) of the entire circle. ● use a circular protractor and a regular protractor

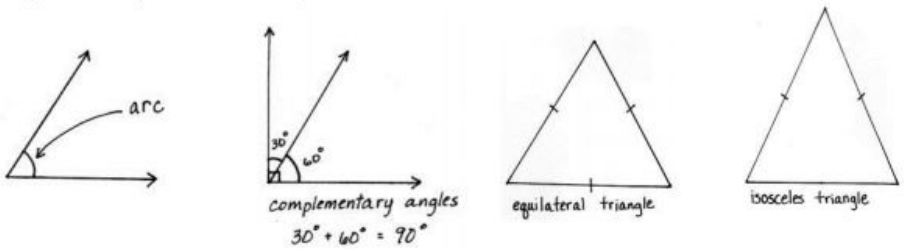
		(learning goal on next page) **Learning Goal 2**: Explain angles as geometric shapes formed by two rays sharing a common endpoint and explain the relationship between a one-degree angle, a circle, and angle measure.
● 4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically.	Concept(s): Angle measurement Students are able to: ● measure and draw angles in whole-number degrees. ● given an angle measure, sketch the angle and verify with a protractor. **Learning Goal 3:** Measure angles in whole number degrees using a protractor and sketch angles of specific measures.
● 4.MD.C.7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	MP.1 Make sense of problems and persevere in solving them. MP.7 Look for and make use of structure.	Concept(s): Problem solving with the addition of angle measures. ● Angle measures may be added; when an angle is decomposed into non-overlapping parts, the angle measure of the whole (original angle) is the sum of the angle measures of the parts. Students are able to: ● decompose angles using pattern blocks ● add and subtract to find unknown angles on a diagram in real world and mathematical problems. ● write an equation with a symbol for the unknown angle measure. **Learning Goal 4:** Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure.
● 4.G.A.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): Two-dimensional figures and symmetry ● *Trapezoid is a quadrilateral with at least one pair of parallel sides.* Students are able to: ● classify triangles based on the presence or absence of perpendicular lines and based on the presence or absence of angles of a particular size. ● classify quadrilaterals based on the presence or absence of parallel or

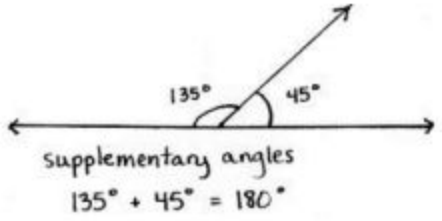
		perpendicular lines and based on the presence or absence of angles of a particular size. **Learning Goal 5:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a particular size; recognize right angles as a category, and identify right, acute, obtuse, equilateral, isosceles, and scalene triangles.
● 4.G.A.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): Two dimensional figures and symmetry Students are able to: ● fold a figure along a line in order to create matching parts. ● identify lines of symmetry as a line across the figure such that the figure can be folded along the line into matching parts. ● identify figures having line symmetry. ● draw lines of symmetry. **Learning Goal 6:** Draw lines of symmetry and identify line-symmetric figures.
Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same*	

	point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2) *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.* *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).* *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4**. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5**. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7**. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually,*

	quantitatively, and orally). ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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** (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 4)** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *Protractors of various diameters, including a 360° and 180° protractor* ❑ *Ruler (used to measure length), straightedge (used to draw straight lines)* ❑ *Right angle template (created in Lesson 2), set square* ❑ *Folded paper models* ❑ *Pattern blocks* ❑ *Rectangular and triangular grid paper*	4.G.A.1 The Geometry of Letters 4.G.A.1 What's the Point? 4.G.A.2 Are these right? 4.G.A.2 Defining Attributes of Rectangles and Parallelograms 4.G.A.3 Finding Lines of Symmetry 4.G.A.3 Lines of symmetry for triangles 4.MD.C.6, 4.MD.C.7, 4.G.A.1 Measuring Angles 4.MD.C.7, 4.G.A.2 Finding an unknown angle

District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Acute angle** (angle with a measure of less than 90°) • **Acute triangle** (triangle with all interior angles measuring less than 90°) • **Adjacent angle** (Two angles $\angle AOC$ and $\angle COB$, with a common side OC , are adjacent angles if C is in the interior of $\angle AOB$.) • **Angle** (union of two different rays sharing a common vertex, e.g., $\angle ABC$) • **Arc** (connected portion of a circle)  • **Collinear** (Three or more points are collinear if there is a line containing all of the points; otherwise, the points are non-collinear.) • **Complementary angles** (two angles with a sum of 90°) • **Degree, degree measure of an angle** (Subdivide the length around a circle into 360 arcs of equal length. A central angle for any of these arcs is called a one-degree angle and is said to have an angle measure of 1°.) • **Diagonal** (straight lines joining two opposite corners of a straight-sided shape) • **Equilateral triangle** (triangle with three equal sides) • **Figure** (set of points in the plane)

- **Interior of an angle** (the convex1 region defined by the angle)
- **Intersecting lines** (lines that contain at least one point in common)
- **Isosceles triangle** (triangle with at least two equal sides)
- **Length of an arc** (circular distance around the arc)
- **Line** (straight path with no thickness that extends in both directions without end)
- **Line of symmetry** (line through a figure such that when the figure is folded along the line, two halves are created that match up exactly)
- **Line segment** (two points, A and B, together with the set of points on the line *A*B between *A* and *B*, e.g., $A\bar{B}$)
- **Obtuse angle** (angle with a measure greater than 90°, but less than 180°)
- **Obtuse triangle** (triangle with an interior obtuse angle)
- **Parallel** (two lines in a plane that do not intersect, e.g., $A\bar{B} \parallel C\bar{D}$)
- **Perpendicular** (Two lines are perpendicular if they intersect, and any of the angles formed between the lines is a 90° angle, e.g.,$\bar{EF} \perp G\bar{H}$.)
- **Point** (precise location in the plane)
- **Protractor** (instrument used in measuring or sketching angles)
- **Ray** (The ray *OA* is the point *O* and the set of all points on the line *OA* that are on the same side of *O* as the point *A*.)
- **Right angle** (angle formed by perpendicular lines, measuring 90°)
- **Right triangle** (triangle that contains one 90° angle)
- **Scalene triangle** (triangle with no sides or angles equal)
- **Straight angle** (angle that measures 180°)
- **Supplementary angles** (two angles with a sum of 180°)
- **Triangle** (A triangle consists of three non-collinear points and the three line segments between them. The three segments are called the sides of the triangle, and the three points are called the vertices.)
- **Vertex** (a point, often used to refer to the point where two lines meet, such as in an angle or the corner of a triangle)
- **Vertical angles** (When two lines intersect, any two non-adjacent angles formed by those lines are called vertical angles or vertically opposite angles.)
- 

Focus Mathematical Concepts

Grade Level Fluency Requirement:

- **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

Prerequisite skills

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

Coherence Map

3.OA.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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)

3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Common Misconceptions:

- Students are confused as to which number to use when determining the measure of an angle using a protractor because most protractors have a double set of numbers.
- Students should have multiple experiences estimating and comparing angles to the Benchmark 90° or right angle. They should explain their reasoning by deciding first if the angle appears to be an angle that is less than the measure of a right angle (90°) or greater than the measure of a right angle (90°). If the angle appears to be less than 90°, it is an acute angle and its measure ranges from 0° to 89°. If the angle appears to be an angle that is greater than 90°, it is an obtuse angle and its measures range from 91° to 179°. Ask questions about the appearance of the angle to help students in deciding which number to use.
- Students believe a wide angle with short sides may seem smaller than a narrow angle with long sides.
- Students can compare two angles by tracing one and placing it over the other. Students will then realize that the length of the sides does not determine whether one angle is larger or smaller than another angle. The measure of the angle does not change.

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 4 Mathematics Curriculum - Revised 2017

Unit 5:Fraction Equivalence, Ordering, and Operations

(Approximate Instructional Time: 9-10 weeks)

NJ Student Learning Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills *(Learning goals are for the Unit but may not necessarily be in sequential order.)*
• 4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 4.NF.B.3a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. 4.NF.B.3b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.] 4.NF.B.3c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. 4.NF.B.3d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): Decomposition and fraction equivalence; addition and subtraction with fractions • Addition/subtraction of fractions is joining/separating parts referring to the same whole. Students are able to: • decompose fractions as a sum of unit fractions using tape diagrams. • decompose fractions into sums of smaller unit fractions using tape diagrams. • decompose both fractions and unit fractions using area models to show equivalence. • write decompositions of fractions as an equation. • develop visual fraction models that represent decomposed fractions and use them to justify decompositions. • add and subtract fractions having like denominators in order to solve real world problems. • develop visual fraction models and write equations to represent real world problems involving addition and subtraction of fractions. • add and subtract mixed numbers with like denominators. **Learning Goal 1:** Decompose a fraction into a sum of fractions with the same denominator in more than one way and record the decomposition as an equation; justify the decomposition with a visual fraction model. **Learning Goal 2:** Add and subtract fractions using a variety of strategies.

denominators, e.g., by using visual fraction models and equations to represent the problem.		
• 4.NF.A.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): Fraction equivalence using multiplication and division • *Equivalent fractions are the same size while the number and size of the parts differ.* Students are able to: • explain, using area models (both multiplication and division), why two fractions are equivalent. • explain fraction equivalence using a tape diagram and the number line, and relate that to the use of multiplication and division. • generate equivalent fractions, using fraction a/b as equivalent to fraction $(n \times a)/(n \times b)$. **Learning Goal 3:** Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models.
• 4.NF.A.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): Fraction comparison • *Fractions may only be compared when the two fractions refer to the same whole.* Students are able to: • create common denominators in order to compare two fractions. • create common numerators in order to compare two fractions. • compare two fractions with different numerators and different denominators by comparing to a benchmark fraction on the number line.. • record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **Learning Goal 4:** Compare two fractions with different numerators or different denominators, recording comparison with >, =, or <, and justifying the conclusion using visual fraction models.

● 4.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 4.NF.B.4a. Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): Repeated addition of fractions as multiplication ● *Fraction Multiplication: any fraction a/b as a multiple of fraction 1/b.* ● *Fraction Multiplication: any multiple of fraction a/b is also a multiple of fraction 1/b.* Students are able to: ● decompose non-unit fractions and represent them as a whole number times a unit fraction using tape diagrams. ● represent *a/b* as a x (1/*b*) using a visual fraction model. ● represent *n* × *(a/b) as (n* × *a)/b* the associative property and in a visual fraction model. ● find the product of a whole number and a mixed number using the distributive property ● solve real world problems by multiplying a fraction by a whole number, using visual fraction models and equations to represent the problem. **Learning Goal 5:** Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction *a/b* as a multiple of 1/*b.* **Learning Goal 6:** Multiply a fraction by a whole number, using a visual fraction model and equations to demonstrate that a multiple of *a/b* is the product of 1/*b* and a whole number. **Learning Goal 7**: Solve 1-step word problems involving multiplication of a fraction by a whole number, using visual fraction models and equations to represent the problem
● 4.MD.B.4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Extending fraction equivalence to fractions greater than 1 Students are able to: ● given a data set consisting of measurements in fractions of a unit, create a line plot. ● using measurement information presented in line plots, add and subtract fractions with like denominators in order to solve word problems. **Learning Goal 8:** Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.

● 4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Addition and subtraction of fractions Students are able to: ● construct diagrams (e.g. number line diagrams) to represent measurement quantities. **Learning Goal 9:** Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).
● 4.OA.C.5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	MP.3 Construct viable arguments and critique the reasoning of others. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Exploring a fraction pattern ● *Patterns contain features that are not explicitly stated in the rule defining the numerical pattern.* Students are able to: ● find and use a pattern to calculate the sum of all fractional parts between 0 and 1. ● share and critique peer strategies. **Learning Goal 10:** Generate a number or shape pattern that follows a rule and identify features of the pattern that are not explicit in the rule.
Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references*	

	consistent?(4.MD.A.1) *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.* *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).* *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4**. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5**. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7**. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.*

	B. Follow agreed-upon rules for discussions and carry out assigned roles. *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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** (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

Green Township School District Grade 4 Mathematics Curriculum - Revised 2017

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 5)** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *Area model* ❑ *Fraction strips (made from paper, folded, and used to model equivalent fractions)* ❑ *Line plot* ❑ *Number line* ❑ *Rulers* ❑ *Tape diagram*	4.NF.A.1 Explaining Fraction Equivalence with Pictures 4.NF.A.1 Fractions and Rectangles 4.NF.A.2 Comparing Fractions Using Benchmarks Game 4.NF.A.2 Doubling Numerators and Denominators 4.NF.B.3a Comparing Sums of Unit Fractions 4.NF.B.3b making 22 Seventeenths in Different Ways 4.NF.B.3c Cynthia's Perfect Punch 4.NF.B.3c Peaches 4.NF.B.4 Extending Multiplication From Whole Numbers to Fractions 4.MD.A.2 Margie Buys Apples 4.MD.B.4 Button Diameters 4.MD.C.6, 4.MD.C.7, 4.G.A.1 Measuring Angles 4.NBT.B.6 mental Division Strategy 4.OA.A.2 Comparing Money Raised 4.OA.C.5 Double Plus One

District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Benchmark** (standard or reference point by which something is measured) • **Common denominator** (when two or more fractions have the same denominator) • **Denominator** (e.g., the 5 in 3 5 names the fractional unit as fifths) • **Fraction greater than 1** (a fraction with a numerator that is greater than the denominator) • **Line plot** (display of data on a number line, using an x or another mark to show frequency) • **Mixed number** (number made up of a whole number and a fraction) • **Numerator** (e.g., the 3 in 3 5 indicates 3 fractional units are selected)

Focus Mathematical Concepts

Grade Level Fluency Requirement:

❖ **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

Prerequisite skills

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

Coherence Map

3.NF.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 size 1/*b*.

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. 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.

b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.

3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

b. 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.

c. 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.*

d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

3.G.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 with equal area, and describe the area of each part as 1/4 of the area of the shape*

Common Misconceptions:

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 4 Mathematics Curriculum - Revised 2017

Unit 6: Decimal Fractions **(Approximate Instructional Time: 4 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
• 4.NF.C.6. Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]	MP.7 Look for and make use of structure.	Concept(s): Exploration of tenths and hundredths Students are able to: • write a decimal as a fraction that has a denominator of 10 or 100. • use understanding of fraction equivalence to investigate decimal numbers on the place value chart expressed in different units. **Learning Goal 1:** Given decimal notation, write fractions having denominators of 10 or 100.
• 4.NF.C.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]	MP.7 Look for and make use of structure.	Concept(s): Exploration and addition with tenths and hundredths Students are able to: • add two fractions with respective denominators of 10 and 100 using equivalent fractions • model the equivalence of tenths and hundredths using the area model and number disks. • use the area model and number line to represent mixed numbers with units of ones, tenths, and hundredths in fraction and decimal forms • model mixed numbers with units of hundreds, tens, ones, tenths, and hundredths in expanded form and on the place value chart • apply understanding of fraction equivalence to add tenths and hundredths. • add decimal numbers by converting to fraction form • solve word problems involving the addition of measurements in decimal form. **Learning Goal 2:** Add two fractions with respective denominators of 10 and 100 using a variety of strategies.

• 4.NF.C.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]	MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): Decimal comparison Students are able to: • use the place value chart and metric measurement to compare decimals and answer comparison questions. • use area models and the number line to compare decimal numbers and record comparisons using <,>, =. • compare and order mixed numbers in various forms. • represent a decimal using a model. • compare two decimals to hundredths by reasoning about their size. • explain that comparisons are valid only when the two decimals refer to the same whole. • record the results of comparisons with the symbols >, =, or <, and justify the conclusions (e.g., by using a visual model). **Learning Goal 3:** Compare two decimals to hundredths by reasoning about their size, demonstrating that comparisons are valid only when the two decimals refer to the same whole; record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
• 4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Money amounts as decimal numbers Students are able to: • express money amounts given in various forms as decimal numbers. • solve word problems involving money. **Learning Goal 4:** Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).

• 4.NF.A.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [Grade 4 expectations in this domain are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100.]		Concept(s): Reinforce through work with 4.NF.5 and 4.NF.6
• 4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 4.NF.B.3c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.		Concept(s): Reinforce through work with 4.NF.5 and 4.NF.6
• 4.NBT.A.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* [Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.]	MP.7 Look for and make use of structure.	Concept(s): Reinforce through work with 4.NF.6
• 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Reinforce through work with 4.NF.7

For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36).		
Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations,*

	or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. ***W.4.2.*** *Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.* *C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because).* *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4****. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5****. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7****. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.*** *Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1****. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2****. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3****. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6****. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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** (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 6)** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *1-liter container with milliliter marks* ❑ *Area model* ❑ *Centimeter ruler* ❑ *Decimal place value disks (tenths and hundredths)*	4.NF.A.1 Explaining Fraction Equivalence with Pictures 4.NF.A.1 Fractions and Rectangles 4.NF.B.3c Cynthia's Perfect Punch 4.NF.C.6 Dimes and Pennies

❑ *Digital scale* ❑ *Meter stick* ❑ *Number line* ❑ *Place value chart with decimals to hundredths* ❑ *Tape diagram* ❑ *Whole number place value disks (hundreds, tens, and ones)*	4.NF.C.6 Expanded Fractions and Decimals 4.NF.C.7 Using Place Value
District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Decimal expanded form** (e.g., (2 × 10) + (4 × 1) + (5 × 0.1) + (9 × 0.01) = 24.59) • **Decimal fraction** (fraction with a denominator of 10, 100, 1,000, etc.) • **Decimal number** (number written using place value units that are powers of 10) • **Decimal point** (period used to separate the whole number part from the fractional part of a decimal number) • **Fraction expanded form** (e.g., (2 × 10) + (4 × 1) + (5 × 1/10) + (9 × 1/100) = 24 & 59/100) • **Hundredth** (place value unit such that 100 hundredths equals 1 one) • **Tenth** (place value unit such that 10 tenths equals 1 one)

Focus Mathematical Concepts

Grade Level Fluency Requirement:

❖ **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

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.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*
3. NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.
3. NF.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*.
3. NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.
3. NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
b. 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.
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
3. MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems [problems involving notions of "times as much").

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 4 Mathematics Curriculum - Revised 2017

Unit 7: Exploring Measurement with Multiplication **(Approximate Instructional Time: 4 weeks)**		
NJ Student Learning Standards	**Suggested Standards for Mathematical Practice**	**Critical Knowledge & Skills** ***(Learning goals are for the Unit but may not necessarily be in sequential order.)***
● 4.OA.A.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics.	Concept(s): Measurement conversion tables. Students are able to: ● solve multiplicative comparison word problems using measurement conversion tables ● share and critique peer strategies **Learning Goal 1:** Write multiplication equations from word problems indicating multiplicative comparisons and describe multiplication equations as comparisons.
● 4.OA.A.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Problem solving with measurement Students are able to: ● use different operations to solve multi-step problems with measurement **Learning Goal 2:** Multiply and divide to solve word problems involving multiplicative comparisons and represent these problems with drawings and equations.
● 4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively.	Concept(s): Problem solving with measurement Students are able to: ● use measurement tools to convert mixed number measurements to smaller units. ● solve multi-step measurement word problems

letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *(benchmarked)	MP.4 Model with mathematics. MP.7 Look for and make use of structure.	• **Learning Goal 3:** Solve multi-step measurement word problems.
• 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36).*	MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): Problem solving with measurement Students are able to: • create conversion tables for length, weight, and capacity units using measurement tools, and use the tables to solve problems. • create conversion tables for units of time, and use the tables to solve problems. • solve problems involving mixed units of capacity. • solve problems involving mixed units of length. • solve problems involving mixed units of weight. • solve problems involving mixed units of time. **Learning Goal 4:** Express measurement in a larger unit in terms of a smaller unit and record equivalent measures in a two-column table.
• 4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): Reinforce through work with 4.OA.2 & 4.OA.3

Interdisciplinary Connections: **NGSS Appendix for Alignment**	***Science:*** **4-PS3 As part of this work, teachers should give students opportunities to use the four operations with whole numbers to solve problems:** *Science example: The class has 144 rubber bands with which to make rubber-band cars. If each car uses six rubber bands, how many cars can be made? If there are 28 students, at most how many rubber bands can each car have (if every car has the same number of rubber bands)? (4.OA.A.3)* **4-PS4 As part of this work, teachers should give students opportunities to draw and identify lines and angles:** *Science example: Identify rays and angles in drawings of wave propagation. (4.GA.1)* **4-LS1 As part of this work, teachers should give students opportunities to recognize symmetry** *Science example: Recognize symmetry, or lack of symmetry, in the internal and external structures of plants and animals. Does the symmetry or lack thereof contribute to the function? (For example, bilateral symmetry is a signal of reproductive fitness in many animals; the asymmetry in an owl's face helps it pinpoint the location of prey.) (4.GA.3)* **4-ESS1 As part of this work, teachers should give students opportunities to solve problems involving measurement:** . *Science example: A limestone layer with many marine fossils is visible in the Grand Canyon. One reference book lists this layer as being 300 feet thick. Another reference book lists this layer as being 100 yards thick. Are the two references consistent?(4.MD.A.1)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS2 As part of this work, teachers should give students opportunities to solve problems involving measurement:** *Science example: (1) One map shows that a particular point in the ocean is 1600 meters deep while another map shows the same point as being 1.5 kilometers deep. Are the two maps consistent? (2) Science example: A coastline reduces by an average of 4 feet per year. In an 18-month period, approximately how much of the coastline has been lost? (4.MD.A,1, 4.MD.A.2)* *Alignment note: Expressing measurements in a smaller unit in terms of a larger unit within the same system of measurement is not expected until Grade 5.* **4-ESS3 As part of this work, teachers should give students opportunities to be quantitative in descriptions:** *Science example: Be quantitative when discussing environmental effects. For example, say not only that a particular oil spill was 'large,' but that 5 million gallons were spilled, or that the oil spill was 40 times larger than the next worst oil spill. (4.OA.A.1)* ***English-Language Arts:*** ***RI.4.1**. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.* ***RI.4.2**. Determine the main idea of a text and explain how it is supported by key details; summarize the text.* ***RI.4.3**. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* ***RI.4.4**. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.* ***RI.4.7**. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.* ***W.4.2.** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.* *A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.* *B. Develop the topic with facts, definitions, concrete details, text evidence , or other information and examples related to the topic.*

	C. Link ideas within paragraphs and sections of information using words and phrases (e.g., another, for example, also, because). *D. Use precise language and domain-specific vocabulary to inform about or explain the topic. E. Provide a conclusion related to the information or explanation presented.* ***W.4.4**. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)* ***W.4.5**. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.* ***W.4.7**. Conduct short research projects that build knowledge through investigation of different aspects of a topic.* ***W.4.8.** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.* ***SL.4.1**. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 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.* *B. Follow agreed-upon rules for discussions and carry out assigned roles.* *C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.* *D. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.* ***SL.4.2**. Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g.,visually, quantitatively, and orally).* ***SL.4.3**. Identify the reasons and evidence a speaker provides to support particular points.* ***SL.4.6**. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation*
21st Century Skills/ Career Ready Practices:	**CRP1. Act as a responsible and contributing citizen and employee.** **CRP2. Apply appropriate academic and technical skills.** **CRP3. Attend to personal health and financial well-being.** **CRP4. Communicate clearly and effectively and with reason.** **CRP5. Consider the environmental, social and economic impacts of decisions.** **CRP6. Demonstrate creativity and innovation.** **CRP7. Employ valid and reliable research strategies.** **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** **CRP9. Model integrity, ethical leadership and effective management.** **CRP10. Plan education and career paths aligned to personal goals.** **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) 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 (Word | PDF) 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. Please see relevant projects for technology standards 8.1 and 8.2:

District/School Primary and Supplementary Resources	
Primary Resource: **Eureka Math (Unbound Ed - Module 7)** **Zearn.org**	**Supplementary Resources:** Number Talks: Building Numerical Reasoning Sadlier Progress In Mathematics Online Resources - Grade 4 ***Sadlier Progress in Mathematics*** Workbook ***Study Island*** ***Excel Math*** (Publisher: AnsMar) Khan Academy Visual Patterns: Gr. K-12 Number Strings Common Core Progression Documents **Performance Tasks are available for use from the following sites:** Illustrative Mathematics Coherence Map Inside Mathematics Problems of the Month Grade 4 YouCubed Tasks
Suggested Materials & Tools:	**Suggested Tasks for Use During Unit**
❑ *Analog clock (with second hand)* ❑ *Balance scale with mass weights* ❑ *Beaker (marked for mL and L)* ❑ *Composite figure* ❑ *Digital scale (metric and customary units)* ❑ *Gallon, quart, pint, and cup containers*	4.OA.A.2 Comparing Money Raised 4.OA.A.3 Carnival Tickets 4.OA.A.3, 4.MD.A.3 Karl's Garden 4.MD.A.1 Who is the tallest? 4.MD.A.2 Margie Buys Apples 4.NBT.B To regroup or not to regroup 4.NBT.B.6 mental Division Strategy

❑ *Meter stick, yard stick, 12-inch ruler, centimeter ruler* ❑ *Number bond* ❑ *Number line* ❑ *Protractor* ❑ *Stopwatch* ❑ *Tape diagram* ❑ *Two-column table*	
District/School Formative Assessment Plan	**District/School Summative Assessment Plan**
• Teacher observation of students engaged in group and independent activities. • Individual and small group conferences/interviews to assess understanding with rubric • Sprints • Self-assessment by students with guidance from teacher. • Exit tickets • Zearn teacher reports • Star and Accelerated Math programs	• Teacher created assessments and projects • ***Sadlier*** Unit Assessments • ***Eureka Math*** Mid- and End- Module Assessments (Constructed response item with rubric) • Teacher/District created benchmark assessments
Instructional Best Practices and Exemplars	**Mathematical Terms/Vocabulary**
❑ *Math Work Stations* ❑ *Use Communicators/manipulatives* ❑ *Number talks* ❑ *Hands-on activities* ❑ *Exploratory activities* ❑ *Games/play* ❑ *Using concrete materials to advance conceptual understanding* ❑ *Use drawings and diagrams to advance conceptual understanding* ❑ *Connect current concepts to previously learned skills*	• **Customary system of measurement** (measurement system commonly used in the United States that includes such units as yards, pounds, and gallons) • **Customary unit** (e.g., foot, ounce, quart) • **Cup** (c) (customary unit of measure for liquid volume) • **Gallon** (gal) (customary unit of measure for liquid volume) • **Metric system of measurement** (base ten system of measurement used internationally that includes such units as meters, kilograms, and liters) • **Metric unit** (e.g., kilometer, gram, milliliter) • **Ounce** (oz) (customary unit of measure for weight) • **Pint** (pt) (customary unit of measure for liquid volume) • **Pound** (lb) (customary unit of measure for weight) • **Quart** (qt) (customary unit of measure for liquid volume)
Focus Mathematical Concepts	

Grade Level Fluency Requirement:

- **4.NBT.B.4** Fluently add/subtract within 1,000,000 using the standard algorithm.

Prerequisite skills

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

Coherence Map

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.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.5 Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of 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.)*
3.OA.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.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.
3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
b. 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.
c. 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 at the same point of a number line diagram.*
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

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.