Roscommon Area Public Schools – Curriculum Framework
Course: Third Grade Math; Eureka Math Squared
Unit Number: 2
Unit Title: Place Value Concepts Through Metric Measurement
Timeframe:

Stage 1: Identify Desired Results	
Essential Question: *What thought-provoking questions will foster inquiry, meaning making and transfer?* • *An essential question is open-ended; it has no simple "right answer."* • *Is meant to be investigated, argued, looked at from different points of view* • *Encourages active "meaning making" by the learner about important ideas.* • *Raises other important questions.* • *Naturally arises*	• How are multiplication and division related?
Scaffold Questions: *What questions can we ask students that break the essential question into smaller pieces of content?*	How do we round numbers to the nearest 10, 100, or 1,000? How do we plot time on a number line? How do we tell and write time to the nearest minute? How do we choose the appropriate unit of measurement?
Brief Summary of Unit:	Students compose and decompose metric measurement units and relate them to place value units up to 1 thousand . They use place value understanding and the vertical number line to

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	round two- and three-digit numbers. Students also add and subtract two- and three-digit numbers within 1,000 by using a variety of strategies, including the standard algorithm.
Desired Understanding: *The long-term accomplishments that students should be able to do with knowledge and skill, on their own. Frames Standards as long-term performance accomplishments. Answer the questions Why? And What can you do with this?*	Students will understand that place value demonstrates the numeric value of numbers and brings an understanding of less than/more than. Understanding place value is important when rounding numbers to the nearest 10's, 100's, and 1,000's. Students learn to use a number line to understand the concept of units of measurement including metric measurement (liters and grams) and time on a clock. This scaffold gives them hands on and visual representations to understand more complex areas of measurement in the future.
Common Core State Standards (CCSS) - Mathematics *List all of the standards in this unit.*	3.OA.8Solve 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 (Order of Operations). 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. 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

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	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 compound units such as cm^3 and finding the geometric volume of a container. Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2). 3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
Mathematical Practices *Which of the mathematical practices will be focused on during this unit?*	MP1 Make sense of problems and persevere in solving them. Students model multiplication and division using the array model. They solve two-step mixed word problems and assess the reasonableness of their solutions. MP2 Reason abstractly and quantitatively. Students make sense of quantities and their relationships as they explore the properties of multiplication and division and the relationship between them. Students decontextualize when representing equal group situations as multiplication and when they represent division as partitioning objects into equal shares or as unknown factor problems. Students contextualize when they consider the value of units and understand the meaning of the quantities as they compute MP3 Construct viable arguments and critique the reasoning of others. Students represent and solve multiplication and division problems using arrays and equations. As they compare methods, they construct arguments and critique the reasoning of others. This practice is particularly exemplified in daily Application Problems and in specific lessons dedicated to problem solving in which students solve and reason with others about their work. MP4 Model with mathematics. Students represent equal groups using arrays and equations to multiply, divide, add, and subtract.

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	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. Students notice structure when they represent quantities by using drawings and equations to represent the commutative and distributive properties. The relationship between multiplication and division also highlights structure for students as they determine the unknown whole number in a multiplication or division equation. 5 In this module, problem solving is limited to factors of 2–5 and 10 and the corresponding dividends. MP8 Look for and express regularity in repeated reasoning
Essential Standards* *List the Essential Standards that will be taught and assessed in this unit.*	3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 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 (Order of Operations). 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.

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	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. Excludes compound units such as cm^3 and finding the geometric volume of a container. Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2). 3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
Crossover standards* *Connection to other content areas (Option)*	
Alignment to the Vision of High Quality	Core practices of ambitious teaching in mathematics, include: • eliciting and responding to student reasoning, • orienting students to each others' ideas and to the mathematical goal,

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Instruction in Mathematics *(How do the instructional targets in this unit align to the district's vision of high quality instruction?)*	• setting and maintaining expectations for student participation, • positioning students competently, • teaching towards an instructional goal, • assessing students' understanding, and • using mathematical representations.
Stage 2: Determine Acceptable Evidence **(With the exception of formative assessments, all assessments listed in this section are required elements of the district's curriculum and the data associated will be collected in the district's performance management driver system.)**	
Measure of Understanding (Performance Task) *(How will students demonstrate their attainment of the desired understanding?)*	Adding Numbers Unit 2 Performance Task & Rubric

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Assessing the Performance Task *(How will we evaluate quality student work in the performance task? How will we determine that students can use their learning independently?)*	*Observed through Exit Tickets*
Summative Assessments *(How will we know if students can demonstrate mastery of the unit's content, skills, and common core state standards?) Can overlap the performance-based evidence, thereby increasing the reliability of the overall assessment (especially if the performance task was done by a group)*	3rd Grade Eureka Squared Module 2 Pre-Assessment- Version 1 3rd Grade Eureka Squared Module 2 Post-Assessment - Version 2
Interim Assessments	
	Exit Tickets

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Formative Assessments	
Student Self-Reflection and Self-Regulation **(Student-Centered)** *(How will we measure students' ability to think meta-cognitively?)*	Individual lesson Exit Tickets and Sprints Student Exit Ticket Self Assessment
State Assessment Practice *(How will we measure students' ability to interact with content and skills in an MSTEP-like or SAT-like format?)*	3rd Grade Eureka Squared Module 2 Pre-Assessment- Version 1 3rd Grade Eureka Squared Module 2 Post-Assessment - Version 2

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Stage 3: Learning Plan
(Summary of Key Learning Events and Instruction)

What activities, experiences and lessons will lead to achievement of the desired results and success at the assessments? *The learning events –* • *should be derived from the goals of Stage 1 and the assessments of Stage 2 to ensure alignment and effectiveness of the activities.* • *should match the level of rigor within the standard* • *support student Acquisition, Meaning Making, and Transfer.*	Sprints: Sprint A • Pass Sprint A out quickly, face down on student desks with instructions to not look at the problems until the signal is given. (Some Sprints include words. If necessary, prior to starting the Sprint, quickly review the words so that reading difficulty does not slow students down.) T: You will have 60 seconds to do as many problems as you can. I do not expect you to finish all of them. Just do as many as you can, your personal best. (If some students are likely to finish before time is up, assign a number to count by on the back.) T: Take your mark! Get set! THINK! Students immediately turn papers over and work furiously to finish as many problems as they can in 60 seconds. Time precisely. T: Stop! Circle the last problem you did. I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready? T: (Energetically, rapid-fire call the first answer.) S: Yes! T: (Energetically, rapid-fire call the second answer.) S: Yes! Repeat to the end of Sprint A or until no student has a correct answer. If needed, read the count-by answers in the same way the Sprint answers were read. Each number counted-by on the back is considered a correct answer. T: Fantastic! Now, write the number you got correct at the top of your page. This is your personal goal or Sprint B. T: How many of you got one right? (All hands should go up.) T: Keep your hand up until I say the number that is one more than the number you got correct. So, if you got 14 correct, when I say 15, your hand goes down. Ready? T: (Continue quickly.) How many got two correct? Three? Four? Five? (Continue until all hands are up) • If the class needs more practice with Sprint A, continue with the optional routine presented below. T: I'll give you one minute to do more problems on this half of the Sprint. If you finish, stand behind your chair. As students work, the student who scored highest on Sprint A might pass out Sprint B. T: Stop! I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready? (Read the answers to the first half again as students stand.) **Movement To keep the energy and fun going,** always do a stretch or a movement game in between Sprints A and B. For example, the class might do jumping jacks while

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skip-counting by 5 for about 1 minute. Feeling invigorated, students take their seats for Sprint B, ready to make every effort to complete more problems this time.

Sprint B

- Pass Sprint B out quickly, face down on student desks with instructions not to look at the problems until the signal is given. (Repeat the procedure for Sprint A up through the show of hands for how many right.) T: Stand up if you got more correct on the second Sprint than on the first. S: (Stand.) T: Keep standing until I say the number that tells how many more you got right on Sprint B. If you got three more right on Sprint B than you did on Sprint A, when I say three, you sit down. Ready? (Call out numbers starting with one. Students sit as the number by which they improved is called. Celebrate the students who improved most with a cheer.) T: Well done! Now, take a moment to go back and correct your mistakes. Think about what patterns you noticed in today's Sprint. T: How did the patterns help you get better at solving the problems? T: Rally Robin your thinking with your partner for 1 minute. Go! Rally Robin is a style of sharing in which partners trade information back and forth, one statement at a time per person, for about 1 minute. This is an especially valuable part of the routine for students who benefit from their friends' support to identify patterns and try new strategies. Students may take Sprints home.

Read/Draw/Write (RDW) practice for word problems: (using RACES strategy)

Mathematicians and teachers suggest a simple process applicable to all grades:
1. Read.
2. Draw and label.
3. Write an equation.
4. Write a word sentence (statement). The more students participate in reasoning through problems with a systematic approach, the more they internalize those behaviors and thought processes. What do I see? Can I draw something? What conclusions can I make from my drawing?

Number bonds:

NOTES ON NUMBER BONDS: The number bond is a pictorial representation of part–part–whole relationships and shows that within a part–whole relationship, smaller numbers (the parts) make up larger numbers (the whole).

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	(Excerpted from "How to Implement A Story of Units.") NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION: The number bond is another way for students to explore the relationship between factors in multiplication. Suggested explorations and questions: Let's count the groups to make sure the number bond matches our number sentence. (1 six, 2 sixes, etc.) What is the number of groups? What is the size of each group? What multiplication sentence represents the number bond? Another option is to have students compare how the number bond can represent multiplication and addition to distinguish the importance of equal groups in multiplication. **Tape diagrams:** NOTES ON MULTIPLE MEANS OF ENGAGEMENT: The numbers in the Application Problem may be too simple. They were chosen to compliment the introduction of the tape diagram in the Concept Development. If needed, change the numbers in the Application Problem to meet the needs of the class,and adjust the opening language of the Concept Development accordingly. Students are familiar with tape diagrams from Grade 2. They use tape diagrams to represent the information given in a problem, and then analyze the model to help determine the unknown and solve. As tape diagrams are reviewed, ask why the diagram might have that name. Guide students to make connections that help them remember the name.
Learning Targets *What will students be taught? What should they know? What should they be able to do?*	**Pre-test on Eureka (Assessment Vs. 1)** **Lesson1:** I can connect the composition of 1 kilogram to the composition of 1 thousand so I can use math in my everyday life. I am successful when I can construct a model so I can explain my thinking (RDW). **Lesson 2:** I can estimate the weight of familiar objects and read scales so I can use math in my everyday life. I am successful when I determine the correct measuring unit and scale weight. **Lesson 3:** I can use all four operations to solve one step word problems involving weight so I can use math in my everyday life. I am successful when I can solve one step word problems. **Lesson 4:** I can connect the decomposition of 1 liter to the decomposition of 1 thousand so I can use math in my everyday life. I am successful when I can construct a model so I can explain my thinking (RDW).

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	Lesson 5: I can estimate and measure liquid volume using a vertical number line and connect composition of one liter to composition of 1 thousand so I can use math in my everyday life. I am successful when I determine the correct measuring unit and unit scale. **Lesson 6:** I can use all four operations to solve one-step word problems involving liquid volume, so I can use math in my everyday life. I am successful when I can construct a model so I can explain my thinking (RDW). **Lesson 7**: I can solve one-step word problems using metric units so I can use math in my everyday life. I am successful when I am successful when I can solve one step word problems. **Lesson 8:** I can read temperatures on a thermometer using number line concepts, so I can use math in my everyday life. I am successful when I interpret a thermometer. **Lesson 9**: I can round two-digit numbers to the nearest ten on the vertical number line so I can use math in my everyday life. I am successful when I utilize a vertical number line to round to the nearest ten. **Lesson 10:** I can round two- and three-digit numbers to the nearest ten on the vertical number line so I can use math in my everyday life. I am successful when I utilize a vertical number line to round to the nearest ten. **Lesson 11**:I can round to the nearest hundred on the vertical number line so I can use math in my everyday life. I am successful when I utilize a vertical number line to round to the nearest hundred. **Lesson 12:** I can estimate sums and differences by rounding, so I can use math in my everyday life. I am successful when I can estimate and explain my thinking. **Lesson 13**: I can collect and represent data in a scaled bar graph and solve related problems so I can use math in my everyday life. I am successful when I represent data on a bar graph and solve related problems. **Lesson 14:** I can use place value understanding to add and subtract like units so I can use math in my everyday life. I am successful when I can select a place value strategy to determine an addition and subtraction problem. **Lesson 15**: I can use the associative property to make the next ten to add so I can use math in my everyday life. I am successful when I use a simplifying strategy to add. **Lesson 16:** I can use composition to add so I can use math in my everyday math. I am successful when I use a simplifying strategy to add. **Lesson 17**: I can Use place value to subtract efficiently using take from a ten so I can use math in my

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	everyday life. I am successful when I use a simplifying strategy to subtract. **Lesson 18:** I can use place value to subtract efficiently using take from a ten so I can use math in my everyday life. I am successful when I use a simplifying strategy to subtract. **Lesson 19:** I can use compensation to subtract so I can use math in my everyday life. I am successful when I use a simplifying strategy to subtract. **Lesson 20:** I can add measurements using the standard algorithm to compose larger units once so I can use math in my everyday life. I am successful when I can use an addition strategy to show my thinking. **Lesson 21:** I can add measurements using the standard algorithm to compose larger units twice so I can use math in my everyday life. I am successful when I can use an addition strategy to show my thinking. **Lesson 22:** I can subtract measurement using the standard algorithm to decompose larger units once so I can use math in my everyday life. I am successful when I can construct a model so I can explain my thinking (RDW). **Lesson 23:** I can subtract measurement using the standard algorithm to decompose larger units twice so I can use math in my everyday life. I am successful when I can use a subtraction strategy to show my thinking. **Lesson 24:** I can subtract measurement using the standard algorithm to decompose larger units across two place values so I can use math in my everyday life. I am successful when I can construct a model so I can explain my thinking (RDW). **Lesson 25:** I can solve two step word problems so I can use math in my every day life. I am successful when I can construct a model so I can explain my thinking (RDW).
How will the unit be sequenced and differentiated to optimize achievement for all learners? *Teaching -*	Due to the progression of lessons, do not skip any lesson. Equip Supporting Activities

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• *should reflect the instructional approaches most appropriate to the goals (not what is easiest or most comfortable for the teacher).* • *should employ resources most appropriate to the goals (not simply march through a textbook or commercial program).* • *be responsive to differences in learners' readiness, interests, and preferred ways of learning.*	
Key Vocabulary	**New:** **capacity** Capacity is the maximum amount a container can hold. It is measured by using units of liquid volume such as liters and milliliters. (Lesson 4) *Capacity is about the container. Liquid volume is about the liquid, regardless of what container it is in.* **gram (g)** A gram is a unit for measuring weight. A centimeter cube weighs about 1 gram. 1,000 grams make 1 kilogram. (Lesson 1)

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kilogram (kg)
A kilogram is a unit for measuring weight. A dictionary weighs about 1 kilogram. A kilogram is 1,000 grams. (Lesson 1)

liquid volume
Liquid volume is the amount of space a liquid takes up. It can be measured by using metric units such as liters and milliliters. (Lesson 4)

liter (L)
A liter is a unit for measuring liquid volume. An average-size water bottle holds about half a liter. A liter is 1,000 milliliters. (Lesson 4)

milliliter (mL)
A milliliter is a unit for measuring liquid volume. A small spoon can hold about 5 milliliters of liquid. 1,000 milliliters make 1 liter. (Lesson 4)

operation
Addition, subtraction, multiplication, and division are operations. In an expression involving two numbers, the symbol between the numbers represents the operation. For example, multiplication is the operation in the expression 4 × 5. (Lesson 3)

round, rounding
To round is to find a benchmark number (e.g., a multiple of 10 or 100) that is close to a given number. For example, rounding 286 to the nearest ten would be 290, and rounding 286 to the nearest hundred would be 300. (Lesson 9)

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scaled bar graph
A scaled bar graph is a bar graph where the tick marks count by a whole number greater than 1. For example, the tick marks on a scaled bar graph could count by fives (i.e., 0, 5, 10, 15, etc.). (Lesson 13)

standard algorithm (for addition and subtraction)
The standard algorithm is the process of adding (or subtracting) like units in a systematic way. Like units are added (or subtracted) one place value at a time. Units are regrouped during (or before) the process, as necessary. (Lesson 20)

≈
A symbol used when two expressions are about equal to each other. For example, 286 is about 290, so we can write 286 ≈ 290. (Lesson 10)

Familiar:

about
addend
bar graph
benchmark
centimeters
comparative language: more than, less than, about the same
compose
decompose

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	divide estimate (noun) estimate (verb) exchange, bundle, unbundle, rename halfway heavier, lighter horizontal interval measure mental math meters multiply number line place value units plot simplifying strategy temperature tick mark vertical weight
Resources *Description or link to resources*	

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