

Roscommon Area Public Schools – Curriculum Framework

Course: Second Grade Math; Eureka Math Squared

Unit Number: 6

Unit Title: Geometry, Measurement, Data

Timeframe: 28 Days



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 do we represent data and patterns visually?*
- *How do we classify geometric shapes?*

Scaffold Questions:

What questions can we ask students that break the essential question into smaller pieces of content?

How do we measure perimeter and area of geometric shapes?
How do we represent information in a picture graph or bar graph?
How do we create an appropriate scale for picture graphs and bar graphs?

Brief Summary of Unit:

In module 6, students tell time to the nearest minute and use linear models to solve and represent elapsed time word problems. Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by the number of sides and angles

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	and make connections to the attributes of shapes. Students recognize perimeter as an attribute of plane figures and solve real-world and mathematical problems involving perimeter. Students also represent and interpret data by using scaled picture graphs, scaled bar graphs, and line plots.
Desired Understanding: <i>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?</i>	Students will be able to solve one-step and two-step word problems including all four operations (addition, subtraction, multiplication, and division). Students will be able to identify the attributes of quadrilaterals and polygons. Students will be able to look at the attributes of a shape and determine what shape it is. Students will understand the relationships between shapes and their attributes and how shapes can be decomposed into other shapes. Ex.: a trapezoid and be decomposed into three triangles. Students will be able to use multiplication when measurements are repeated. Students will understand the relationship between perimeter and area. Students will be able to solve area and perimeter using addition, subtraction, multiplication, and division. Students will be able to show data in tape diagrams where units are equal groups with a value greater than 1. Students will understand the relationship between tape diagrams and how they can become units/bars of scaled graphs. Students will be able to apply well-practiced skip-counting and multiplication strategies to analyze bar graphs. Students will apply what they learned about fractions in unit 5 in order to analyze that intervals on a bar graph are not always wholes. Students will be able to choose appropriate intervals within which to display a particular set of data.
Common Core State Standards (CCSS) - Mathematics <i>List all of the standards in this unit.</i>	5.OA.B.3 5.NF.B.4b 5.G.A.1 5.G.A.2 5.G.B.4

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Mathematical Practices <i>Which of the mathematical practices will be focused on during this unit?</i>	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics. MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.
Essential Standards* <i>List the Essential Standards that will be taught and assessed in this unit.</i>	Reason with shapes and their attributes. 3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. 3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. Represent and interpret data. 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets. 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with

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	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. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. 3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Crossover standards* <i>Connection to other content areas (Option)</i>	
Alignment to the Vision of High Quality Instruction in Mathematics <i>(How do the instructional targets in</i>	eliciting and responding to student reasoning, • orienting students to each others' ideas and to the mathematical goal, • setting and maintaining expectations for student participation, • positioning students competently, • teaching towards an instructional goal, • assessing students' understanding, and

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this unit align to the district's vision of high quality instruction?)

- 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?)

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Assessing the Performance Task <i>(How will we evaluate quality student work in the performance task? How will we determine that students can use their learning independently?)</i>	
Summative Assessments <i>(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)</i>	Pre-Test: Assessment Version 1 Post-Test: Assessment Version 2
Interim Assessments	
Formative Assessments	Daily Exit Tickets

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Student Self-Reflection and Self-Regulation (Student-Centered) <i>(How will we measure students' ability to think meta-cognitively?)</i>	Daily Exit Tickets Self Assessment
State Assessment Practice <i>(How will we measure students' ability to interact with content and skills in an MSTEP-like or SAT-like format?)</i>	Pre-Test: Assessment Version 1 Post-Test: Assessment Version 2
Stage 3: Learning Plan (Summary of Key Learning Events and Instruction)	

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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:

- **Directions for Administration of Sprints Sprints are designed to develop fluency.** They should be fun, adrenaline-rich activities that intentionally build energy and excitement. A fast pace is essential. During Sprint administration, teachers assume the role of athletic coaches. A rousing routine fuels students' motivation to do their personal best. Student recognition of increasing success is critical, and so every improvement is celebrated. One Sprint has two parts with closely related problems on each. Students complete the two parts of the Sprint in quick succession with the goal of improving on the second part, even if only by one more. With practice, the following routine takes about 9 minutes.

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

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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 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?

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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). (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.
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- **Tape diagrams:**
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- 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.
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- 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?

Lesson 1: I can relate skip-counting by fives on the clock to telling time on the number line. I am successful when I can show how to count by 5s to find the time and represent that time on a number line.

Lesson 2: I can count by fives and ones on the number line as a strategy for telling time to the nearest minute on the clock. I am successful when I can show how to count by 1s and 5s to find the time and represent that time on a number line.

Lesson 3: I can solve time word problems where the end time is unknown so I can use math in my

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everyday life. I am successful when I can solve a word problem about time to find the unknown end time.

Lesson 4: I can solve time word problems where the start time is unknown so I can use math in my everyday life. I am successful when I can solve a word problem about time to find the unknown start time.

Lesson 5: I can solve time word problems where the change in time is unknown so I can use math in my everyday life. I am successful when I can solve a word problem about time.

Lesson 6: I can solve time word problems and use time data to create a line plot so I can use math in my everyday life. I am successful when I can solve a two part word problem about time.

Lesson 7: I can count coins and create money word problems so I can use math in my everyday life. I am successful when I can solve a two part word problem about money.

Lesson 8: I can compare and classify quadrilaterals so I can use math in my everyday life. I am successful when I can group quadrilaterals based on similarities.

Lesson 9: I can compare and classify other polygons so I can use math in my everyday life. I am successful when I can explain and evaluate a shape that is not a regular polygon.

Lesson 10: I can draw polygons with specified attributes so I can use math in my everyday life. I am successful when I can solve a riddle that is a rectangle with a length OR width of 5 cm.

Lesson 11: I can reason about composing polygons by using tetrominoes so I can use math in my everyday life. I am successful when I can use tetrominoes to build a rectangle that is 20 square units.

Lesson 12: I can reason about composing polygons by using tangrams so I can use math in my everyday life. I am successful when I can create a trapezoid using at least 4 tangram pieces that are not a square.

Lesson 13: I can decompose quadrilaterals to understand perimeter as the boundary of a shape so I can use math in my everyday life. I am successful when I can identify the perimeter and area of a shape.

Lesson 14: I can measure side lengths in whole-number units to determine the perimeters of polygons so I can use math in my everyday life. I am successful when I can accurately measure a shape and find

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the perimeter.

Lesson 15: I can recognize perimeter as an attribute of shapes so I can use math in my everyday life. I am successful when I can find the perimeter of a polygon.

Lesson 16: I can solve problems to determine the perimeters of rectangles with the same area so I can use math in my everyday life. I am successful when I explain how to determine the area and perimeter of different rectangles.

Lesson 17: I can solve problems to determine the area of rectangles with the same perimeter so I can use math in my everyday life. I am successful when I determine the area and perimeter of different rectangles.

Lesson 18: I can solve real-world problems involving perimeter and unknown measurements so I can use math in my everyday life. I am successful when I can measure and determine the perimeter of each shape.

Lesson 19: I can measure the perimeter of various circles so I can use math in my everyday life. I am successful when I determine the perimeter of a circle.

Lesson 20: I can record measurement data in a line plot so I can use math in my everyday life. I am successful when I can create a line plot that accurately represents data in a table.

Lesson 21: I can create and analyze a line plot for measurement data to the nearest half unit and quarter unit so I can use math in my everyday life. I am successful when I can create a line plot that accurately represents data in a table.

Lesson 22: I can generate categorical data and represent it by using a scaled picture graph so I can use math in my everyday life. I am successful when I can read and accurately evaluate a scaled picture graph.

Lesson 23: I can solve problems by creating scaled picture graphs and scaled bar graphs so I can use math in my everyday life. I am successful when I can read and accurately evaluate a scaled picture graph.

Lesson 24: I can organize, count, and represent a collection of objects so I can use math in my everyday life. I am successful when I can complete this task and self-evaluate.

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	Lesson 25: I can name and count numbers greater than 1,000 so I can use math in my everyday life. I am successful when I can accurately skip count with greater numbers focusing on place value. Lesson 26: I can fluently multiply and divide within 100 and add and subtract within 1,000 so I can use math in my everyday life. I am successful when I can self-evaluate.
How will the unit be sequenced and differentiated to optimize achievement for all learners? Teaching - • 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.	Due to the progression of lessons, do not skip lessons unless absolutely necessary. Based on exit tickets, small groups will be utilized to give extra support for students who show low levels of understandings of each topic. Special Education will give support. Equip supporting activities

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Key Vocabulary

New:

diagonal

A diagonal in a polygon is a line segment connecting two corners that are not next to each other. (Lesson 8)

measurement data

When the same type of measurement is taken for a group of objects, the group of measurements is called measurement data. One example of measurement data is a list of the heights of everyone in a classroom. (Lesson 21)

In grade 6, students start using the term numerical data to mean the same thing as measurement data. They also explore the differences between measurement data or numerical data and categorical data.

perimeter

The perimeter of a shape is the length of its boundary. (Lesson 13)

Informally and in grade 3, the term perimeter can also be used to mean the boundary itself (not just the length of the boundary). In grade 4, students more precisely define what they mean by shape, and they also more precisely use perimeter to mean the length of the boundary (not the boundary itself).

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regular polygon

A regular polygon is a polygon with all sides the same length and all angles the same size. (Lesson 9)

In grade 4, students learn that angles are the same size if they have the same measure.

scaled picture graph

A scaled picture graph is a picture graph where each picture, or symbol, represents more than 1 object or observation. (Lesson 22)

Familiar:

analog clock
area
attribute
data
fraction
frequent
hexagon
key
line plot
octagon
parallel
parallelogram
pentagon

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	plot polygon quadrilateral quarter past, quarter to rectangle rhombus right angle scale scaled bar graph square survey tangram trapezoid
Resources <i>Description or link to resources</i>	Module 6 Overview Number Rock songs