

Roscommon Area Public Schools – Curriculum Framework

Course: 5th Grade Math; Eureka Math Squared

Unit Number: 1

Unit Title: Place Value Concepts for Multiplication & Division of Whole Numbers

Timeframe: 26 days (20 lessons / 4 topic quizzes / 1 pre-module & 1 post module assessment)



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

In what ways can I connect and apply my math understanding to the real world?

Scaffold Questions:

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

- What does this image have to do with math?
- In what ways is math the same and different over time?
- In what ways is math the same and different in other parts of the world?
- When would you need to use place value in the real world?
- In what ways is a standard algorithm better than other place value strategies for calculation?
- Why is it important to be fluent with standard algorithms?



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Brief Summary of Unit:	In module 1, students describe place value relationships, express powers of ten with exponents, convert metric measurements, and multiply and divide by multi-digit numbers. They develop fluency with the standard algorithm for multiplication.
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>	In module 1, students describe place value relationships, express powers of ten with exponents, convert metric measurements, and multiply and divide by multi-digit numbers. They develop fluency with the standard algorithm for multiplication. In 5th grade, students will be able to use place value knowledge and times as much as language to learn about decimal numbers. Students will see how the strategies they use for whole-number operations extend to operations with decimal numbers. They will convert metric measurements from smaller units to larger units. In 6th grade, students will be able to divide whole numbers with any number of digits by using the standard algorithm. Students build upon grade 5 knowledge by writing and evaluating numerical expressions with terms that have whole-number bases and exponents.
Common Core State Standards (CCSS) - Mathematics <i>List all of the standards in this unit.</i> <i>“Students should spend the large majority of their time (at least 65% up to 85%) on the major work of the grade. Supporting work and, where appropriate, additional work can engage students in the major work of the grade.” (CCSS Where to Focus Grade 5 Mathematics)</i>	<u>EM² Achievement Indicators connected with CCSS for Module 1</u> 5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm. 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-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. 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

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Mathematical Practices <i>Which of the mathematical practices will be focused on during this unit?</i>	MP2 Reason abstractly and quantitatively. MP6 Attend to precision.
Essential Standards* <i>List the Essential Standards that will be taught and assessed in this unit.</i>	5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm. 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
Crossover standards* <i>Connection to other content areas (Option)</i>	5.S.L.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. 5. S.L.1 B Follow agreed-upon rules for discussions and carry out assigned roles. 5.S.L.1 C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others 5. S.L.1 D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions. 5.W.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. 5.W.1B Provide logically ordered reasons that are supported by facts and details. 5.W.1.C Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically). 5.W.1.D Provide a concluding statement or section related to the opinion presented.

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Alignment to the Vision of High Quality Instruction in Mathematics

(How do the instructional targets in this unit align to the district's vision of high quality instruction?)

- Teacher establishes clear goals for the mathematics that students are learning, situates targets within learning progressions, and uses the targets to guide instructional decisions.
- Teacher engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allows multiple entry points and varied solution strategies.
- Teacher engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
- Teacher facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.
- Teacher uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.
- Teacher builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
- Teacher consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.
- Teacher uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.
- Teacher provides instructional scaffolding with the gradual release model of instruction to ensure students are able to construct meaning of mathematics.
- Students solve problems without giving up.
- Students think about numbers in many different ways.
- Students explain and justify their thinking and understand the thinking of others.
- Students show, analyze and revise their work in many different ways.
- Students use math tools and explain why they chose them.
- Students calculate accurately and efficiently, evaluate their work, and clearly communicate their thinking.
- Students use what they know to solve new problems.
- Students solve problems by looking for rules and patterns and evaluate their results.
- Students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.

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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?)

Each Topic Assessment has contextual problems included.

Possible tasks for future:

<http://tasks.illustrativemathematics.org/content-standards/5/NBT>

<http://tasks.illustrativemathematics.org/content-standards/5/OA>

<https://www.insidemathematics.org/performance-assessment-tasks>

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?)

When given online, the contextual problems are automatically scored using a rubric, giving partial credit for partial understanding of the concepts.

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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>	Module 1 Post-Assessment Version 1 (access in Digital Great Minds) <i>Students take these assessments online and record their work on the paper copy of the assessments.</i>
Interim Assessments	• Equip Assessment • Problem set questions • Topic A, Topic B, Topic C quizzes
Formative Assessments	• Exit Ticket for each lesson • Post Assessment <i>* Students take this assessment online and record their work on the paper copy of this assessment.</i>
Student Self-Reflection and Self-Regulation (Student-Centered) <i>(How will we measure students' ability to think meta-cognitively?)</i>	• Students write a reflection about meeting the success criteria for each lesson as part of their exit ticket • Students answer the "key questions" for each lesson as part of their exit ticket • Students give themselves a "grade" of understanding G- got it, S- sorta got it, H- still need help) • Next day, students self-check their exit tickets daily updated their assessment of their learning and write a note explaining why

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State Assessment Practice

(How will we measure students' ability to interact with content and skills in an MSTEP-like or SAT-like format?)

[Module 1 Post-Assessment](#) Version 2 (access in Digital Great Minds)

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*

Topic A: Place Value Understanding for Whole Numbers

Students use multiplicative comparison statements to explain that a digit in one place represents 10 times as much as what it represents in the place to the right. Students notice how digits of a number shift when they multiply or divide by a power of 10 and express a power of 10 in exponential form. Then students find products and quotients by using powers of 10 and convert metric measurements from larger to smaller units.

Topic B: Multiplication of Whole Numbers

Students build fluency with multiplying multi-digit numbers by using the standard algorithm. They use place value understanding to visualize the decomposition of factors while they multiply a single digit at a time by another single digit in the standard algorithm.

Topic C: Division of Whole Numbers

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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.*

Students use methods based on place value to find quotients of whole numbers with up to four-digit dividends and two-digit divisors. They estimate quotients, then use tape diagrams, area models, and vertical form to record quotients and remainders.

Topic D: Multi-Step Problems with Whole Numbers

Students move between written, pictorial, and numeric representations of mathematical statements. They use tape diagrams to determine when parentheses are needed in expressions and evaluate expressions containing grouping symbols.

Lesson Format

Fluency

Fluency provides distributed practice with previously learned material. It is designed to prepare students for new learning by activating prior knowledge and bridging small learning gaps.

Launch

Launch creates an accessible entry point to the day's learning through activities that build context and often create productive struggle that leads to a need for the learning that follows. Every Launch ends with a transition statement that sets the goal for the day's learning.

Learn

Learn presents new learning related to the lesson objective, usually through a series of instructional segments. This lesson component takes most of the instructional time. Suggested facilitation styles vary and may include direct instruction, guided instruction, group work, partner activities, interactive video, and digital elements. The Problem Set, an opportunity for independent practice, is included in Learn.

Land

Land helps you facilitate a brief discussion to close the lesson and provides students with an opportunity to complete the Exit Ticket. In the Debrief portion of Land, suggested questions, including key questions related to the objective, help students synthesize the day's learning. The Exit Ticket provides a window into what students understand so that you can make instructional decisions.

Learning Targets

Note: EM2 resource used to develop: Topic Level→Topic Overview→ Progression of Lessons

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<i>What will students be taught? What should they know? What should they be able to do?</i>	<i>(Learning target developed from “I can” statement. Purpose connected to UbD essential question. Success Criteria developed from the lesson summary.</i> See attached slides for... Learning Targets/Purpose/Success Criteria Google Slides
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.	<i>Unit will be sequenced in same order as presented in the curriculum.</i> <i>The following lessons can be skipped for pacing due to having non-essential standards that are also covered in later lessons.</i> • Topic D Lessons 19 & 20 <i>Using team jobs helps with differentiating instruction and also prepares students for math instruction through high school. (See resources for description of jobs)</i> <i>Lessons are differentiated in the following ways:</i> • Partner work expectations: Work on your own and be there for your partner or work together with your partner (check in our your partner) • Workbooks are done as partner work, and focus is on understanding. • Partners/teams are created with students at all ability levels, so there can be peer support • Workbook practice questions are in order from least difficult to most difficult, so students needing more support start with easiest problems and work their way to more difficult problems. Students that are early finishers/need more challenge are able to complete the latter problems, which are more application and extension problems
Key Vocabulary	<u>New</u> centigram A centigram is a metric unit for measuring weight. A gram is 100 centigrams. A large ant weighs about

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1cg. (Lesson 5)

centiliter A centiliter is a metric unit for measuring capacity or liquid volume. A liter is 100 centiliters. (Lesson 5)

dividend In a division expression, the number being divided by another number is the dividend. For example, in the expression $18 \div 3$, the dividend is 18. (Lesson 12)

exponent An exponent represents how many times the same number is used as a factor. (Lesson 3)

exponential form A number with an exponent is in exponential form. (Lesson 3)

kiloliter A kiloliter is a metric unit for measuring capacity or liquid volume. A kiloliter is 1,000 liters. (Lesson 5)

milligram A milligram is a metric unit for measuring weight. A gram is 1,000 milligrams. A small feather weighs about 1 mg. (Lesson 5)

millimeter A millimeter is a metric unit for measuring length. A meter is 1,000 millimeters. (Lesson 5)

power of 10 A number that can be written as a product of 10s, or as a 10 with an exponent, is a power of 10. 100 is a power of 10. (Lesson 3)

Familiar

centimeter
convert
distributive property
divisor
express
factor
kilogram
partial products
partial quotients
quotient
remainder
standard algorithm

Academic Verbs

analyze
consider
evaluate

Resources

Description or link to resources

[Materials List by Lesson for Module 1](#)

[Pacing Guide](#)

[5th Grade Essential Standards](#)

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	Team Jobs
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