

SCHOOL DISTRICT OF THE CHATHAMS

Mathematics Grade 5 Full Year

Course Overview

In Grade 5 mathematics, students will focus on three critical areas in alignment with the New Jersey Student Learning Standards for Mathematics. First, students will develop fluency with addition and subtraction of fractions, and develop understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions). Second, students will extend their understanding of division to 2-digit divisors, integrate decimal fractions into the place value system, develop understanding of operations with decimals to hundredths, and develop fluency with whole number and decimal operations. Finally, students will develop an understanding of volume. Students will engage in a variety of differentiated activities throughout the year, aligned with the Standards for Mathematical Practice.

New Jersey Student Learning Standards

The New Jersey Student Learning Standards (NJSLS) can be located at www.nj.gov/education/cccs/2020/.

Operations and Algebraic Thinking:

- 5.OA.A. Write and interpret numerical expressions.
- 5.OA.B. Analyze patterns and relationships.

Number and Operations in Base Ten:

- 5.NBT.A. Understand the place value system.
- 5.NBT.B. Perform operations with multi-digit whole numbers and with decimals to hundredths.

Number and Operations—Fractions:

- 5.NF.A. Use equivalent fractions as a strategy to add and subtract fractions.
- 5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data:

- 5.MD.A. Convert like measurement units within a given measurement system.
- 5.MD.B. Represent and interpret data.
- 5.MD.C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Geometry:

- 5.G.A. Graph points on the coordinate plane to solve real-world and mathematical problems.
- 5.G.B. Classify two-dimensional figures into categories based on their properties.

Technology Standards

- 9.4.2.IML.2: Represent data in a visual format to tell a story about the data.
- 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.

9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose

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9.4.2.CI.2: Demonstrate originality and inventiveness in work

9.4.2.CT.3: Use a variety of types of thinking to solve problems

9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global

Career Ready Practices

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

Interdisciplinary Connections

Computer Science

8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

English Language Arts

- NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Science

- 5-PS1-1. Develop a model
- 5-PS1-2 Measure and graph quantities
- 5-PS1-3 Make observations and measurements to identify materials based on their properties
- 5-ESS1-2 Represent data in graphical displays to reveal patterns

Units of Study

Unit 1 - Understand Place Value (~14 days)

- How are whole numbers and decimals written, compared, and ordered?

Unit 2 - Add and Subtract Decimals to Hundredths (~12 days)

- How can sums and differences of decimals be estimated?
- What are the standard procedures for adding and subtracting decimals?
- How can sums and differences be found mentally?

Unit 3 - Fluently Multiply Multi-digit Whole Numbers (~9 days)

- What are the standard procedures for estimating and finding products of multi-digit numbers?

Unit 4 - Use Models and Strategies to Multiply Decimals (~14 days)

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- What are the standard procedures for estimating and finding products involving decimals?

Unit 5 - Use Models and Strategies to Divide Whole Numbers (~11 days)

- What is the standard procedure for division and why does it work?

Unit 6 - Use Models and Strategies to Divide Decimals (~14 days)

- What are the standard procedures for estimating and finding quotients involving decimals?

Unit 7 - Use Equivalent Fractions to Add and Subtract Fractions (~18 days)

- How can sums and differences of fractions and mixed numbers be estimated?
- What are standard procedures for adding and subtracting fractions and mixed numbers?

Unit 8 - Apply Understanding of Multiplication to Multiply Fractions (~10 days)

- What does it mean to multiply whole numbers and fractions?
- How can multiplication with whole numbers and fractions be shown using models and symbols?

Unit 9 - Apply Understanding of Division to Divide Fractions (~12 days)

- How are fractions related to division? How can you divide with whole numbers and unit fractions?

Unit 10 - Understand Volume Concepts (~10 days)

- What is the meaning of volume of a solid? How can the volume of a rectangular prism be found?

Unit 11 - Convert Measurements (~8 days)

- What are customary measurement units and how are they related?
- What are metric measurement units and how are they related?

Unit 12 - Represent and Interpret Data (~9 days)

- How can line plots be used to represent data and answer questions?

Unit 13 - Algebra: Write and Interpret Numerical Expressions (~12 days)

- How is the value of a numerical expression found?

Unit 14 - Graph Points on the Coordinate Plane (~11 days)

- How are points plotted?
- How are relationships shown on a graph?

Unit 15 - Algebra: Analyze Patterns and Relationships (~15 days)

- How can number patterns be analyzed and graphed?
- How can number patterns and graphs be used to solve problems?

Unit 16 - Classifying Two-dimensional Figures (~10 days)

- How can triangles and quadrilaterals be described, classified, and named?

Learning Objectives/Discipline Standards of Practice

Learning Objectives:

- What is the relationship between digits in a multi-digit number?
- How can you compare whole numbers and decimal values?

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- How does rounding help with estimation?
- How do you round to decimal places?
- What are strategies used to perform operations on decimal numbers?
- How can the relationships between inverse operations help solve math problems?
- What is the relationship between partial products and the standard multiplication algorithm?
- How can visual models representing operations with decimals help understand the algorithms?
- Do algorithms with whole numbers extend to decimal operations?
- How do rectangular arrays and area models help with the understanding of division?
- How can an understanding of equivalent fractions help with adding and subtracting fractions?
- How do we use decimal and fraction operations to make sense of and solve real world scenarios?
- How are benchmark fractions used to help estimate and mentally assess fraction operations?
- How is estimation used to assess the reasonableness of answers?
- How can an understanding of the concepts of multiplication and division be extended to fractions?
- What are applications of multiplication and division? How do terms like scaling relate to multiplication and division?
- What is the relationship between fractions and division?
- What kind of factors produce larger or smaller products than the original number and why?
- Understand volume as an attribute of 3-dimensional figures.
- How does the idea of volume relate to the operations of multiplication and addition?
- Understand what defines a unit cube and how is it used to find volume?
- Understand when and how to use formulas to help find the volume of a figure.
- How are different units of measurement related?
- How can understanding graphs help us solve problems?
- Understand how to make line plots involving fractional units.
- How can verbal expressions be represented symbolically?
- Understand how the use of grouping symbols affects order of operations in simplifying expressions.
- Understand how grouping symbols affects an expression's quantity.
- Understand the coordinate system, the vocabulary that is associated with it, and how to plot points.
- How to use the coordinate system to make sense of problems and work with values in a visual context.
- Introduce understanding of sequences through numerical rules and patterns.
- Analyze numerical relationships and use mathematical vocabulary to explain said relationships.
- Understand attributes of two-dimensional figures and use said attributes to classify figures

Discipline Standards of Practice:

MP.1: Make sense of problems and persevere in solving them

MP.2: Reason abstractly and quantitatively

MP.3: Construct viable arguments

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

MP.8: Look for and express regularity in repeated reasoning

Instructional Resources and Materials

Whole class resources have been identified with an asterisk.

Resources

- *Big Ideas Math MRL CC Grade 5, 2022*

Materials

- Illustrative Mathematics
- Inside Mathematics
- IXL
- Beast Academy
- Trade Books
- Manipulatives*
- Math Word Wall*

Assessment Strategies

Assessment is designed to measure a student's mastery of a course standard and learning objective. Assessment can be used for both instructional purposes (formative assessment) and for evaluative purposes (summative assessment).

Course Specific Assessments Include:

- Tests
- Quizzes
- Projects
- Unit Assessments
- Chapter Assessments
- Chapter Projects