

BLOOMINGDALE PUBLIC SCHOOLS

MATHEMATICS GRADE 5

Adapted from:

New Jersey Student Learning Standards
New Jersey Department of Education Instructional Units for Mathematics

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I. OVERVIEW

The purpose of the Grade 5 mathematics curriculum is to continue to develop and foster the mathematical concepts and skills which are essential to everyday living and to prepare students for further mathematical study. Emphasis is placed throughout the curriculum on developing and encouraging a variety of problem solving strategies. Student proficiency in computational skills needed in solving problems is stressed. Lessons are prepared and implemented developmentally, sequentially and with the understanding that learning proceeds from concrete to abstract levels. Throughout the course emphasis is placed upon broadening the students' consciousness and knowledge of basic computational skill sets, problem solving techniques, developing thinking skills and fostering a positive attitude toward mathematics.

II. RATIONALE

This course is the sixth in the six-year elementary school sequence (K-5) and is aligned with the New Jersey Learning Standards for Mathematics, as well as the 2009 New Jersey Technology Literacy Standards and the district's technology standards. The K-6 mathematics program provides students with content-specific skills and concepts while developing problem-solving skills and strategies, communication, and reasoning. Lessons are prepared and implemented developmentally, sequentially and with the understanding that learning proceeds from concrete to abstract levels.

III. AFFIRMATIVE ACTION COMPLIANCE STATEMENT

Bloomingtondale Public Schools are committed to the achievement of increased cultural awareness, respect, and equity amongst our students, teachers, and community. We are pleased to present all pupils with information pertaining to possible career, professional, or vocational opportunities which in no way restricts or limits options on the basis of race, color, creed, religion, sex, ancestry, national origin, or socioeconomic status.

IV. STUDENT OUTCOMES (Link to New Jersey Student Learning Standards)

In accordance with district policy as mandated by the New Jersey Administrative Code and the New Student Learning Standards, the following are proficiencies required for the successful completion of the above named course.

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As a result of a Bloomingdale Mathematics education, students will be able to...

- Synthesize mathematical skills across disciplines
- Develop into confident mathematicians
- Learn at their own pace and advance their understanding in a variety of ways
- Collaborate with others and contribute productively and articulately
- Act responsibly and be accountable for actions, in person and online
- Effectively approach, analyze, plan, and apply appropriate strategies for problem solving in ambitious contexts with accommodations for those who need it.
- Persevere through difficult situations and tasks and maintain a growth mindset despite adversity.
- Draw on knowledge from a wide variety of mathematical topics with flexibility to approach the same problem from different mathematical perspectives or represent the mathematics in different ways.
- Evaluate situations, draw logical conclusions, and develop, describe and apply solutions.
- Construct and support arguments.
- Evaluate their own reasoning and critique the reasoning of others.
- Assess the reasonableness of a solution with respect to the given construct or problem context.
- Use effective communication to engage in peer collaboration, reflecting on whether or not a solution is viable.
- Create appropriate representations of mathematical situations across a variety of mediums. These models will support the student's ability to demonstrate and explain their mathematical understanding.
- Use mathematical tools to explore and deepen their understanding of mathematical concepts.
- Make effective choices regarding the use of any available tools.
- Make appropriate use of technology as a tool that is constantly changing and evolving.
- Attend to precision in their mathematical calculations and in their communication.
- Calculate accurately and efficiently and express numerical answers with a degree of precision that is appropriate to the given context.
- Develop precision in their use of mathematical language.
- Look closely to determine patterns and structures within mathematics.
- Make meaningful connections between their knowledge from previous experiences and the content they are currently exploring.
- Develop deep understandings of mathematical concepts such that these understandings become applicable building blocks for future learning.
- Use their mathematical understandings to make generalizations that apply to various mathematical circumstances.
- Identify patterns in mathematics that can be used to solve problems that are challenging relative to their learning comfort zone.
- Use generalizations to increase the efficiency and manageability of their work.

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- Demonstrate growth mindset and grit in effectively approaching ever-rigorous problem solving.
- Apply appropriate strategies with differentiated levels of support.
- Be confident in participating in higher level discussions that will assess and advance the understanding of concepts.
- Learn mathematics through exploring and solving contextual and mathematical problems

V. Links to NEW JERSEY STUDENT LEARNING STANDARDS

- Visual and Performing Arts
- English Language Arts
- Mathematics
- Science
- Social Studies
- Technology
- 21st Century Life and Careers

VI. INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Students with IEPs, 504s, and/or Students at Risk of Failure Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided through conferences and small groups. The teacher utilizes visual and multi-sensory methods of instruction in addition to assistive technology when needed. Students are provided with graphic organizers and other scaffolded material. Modification of content and product may be deemed necessary based on student needs. Students are provided with testing accommodations and authentic assessments.

Gifted & Talented Students Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to the student through conferences and small groups. Students are engaged through inquiry-based instruction to develop higher-order thinking skills. Activities are developed based on student interests and student goals. Students engage in real-world projects and scenarios.

English Language Learners Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to students through conferences and small groups. Students are pre-taught vocabulary terms and concepts. Teachers engage students through visual learning, including the use of graphic organizers. Teachers use cognates to increase comprehension. The teacher models tasks and concepts, and pairs students learning English with students who have more advanced English language skills. Scaffolding is provided including word walls, sentence frames, think-pair-share, cooperative learning groups, and teacher think-alouds.

VII. 21ST CENTURY THEMES & SKILLS

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Embedded in many of our units of study and problem based learning projects are the 21st Century Themes as prescribed by the New Jersey Department of Education. These themes are as follows:

- Global Awareness
- Financial, Economic, Business, and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy

VIII. CURRICULUM ADDENDA FOR SPECIAL EDUCATION

This curriculum can be both grade and age appropriate for special education students and serves as a guide for the special education teacher in line with the district's written philosophy of special education, as stated within Policy #6700 concerning Programs for Educationally Disabled Students. Based on the Child Study Team evaluation and consultation with the parent and classroom teacher, an individualized education plan may include modifications to content, instructional procedures, student expectations, and targeted achievement outcomes of this curriculum document in accordance with the identified needs of an eligible student. This educational plan will then become a supplement guide that the classroom teacher, parent, and Child Study Team will use to measure the individual student's performance and achievement.

IV. CURRICULUM ADDENDA FOR ENGLISH LANGUAGE LEARNERS

This curriculum guide is appropriate and is implemented for all students according to age and grade, and is in line with the district's written philosophy of English language acquisition concerning Bilingual Instruction and English as a Second Language Programs. In accordance with the New Jersey Administrative Code 6A:15, the contents herein provide equitable instructional opportunities for English Language Learners to meet the New Jersey Student Learning Standards and to participate in all academic and non-academic courses. Students enrolled in a Bilingual and/or an ESL program may, in consultation with the classroom teacher and Bilingual and/or ESL teacher, receive modification to content, instructional procedures, student expectations and targeted achievement outcomes of this curriculum document in accordance with the students developmental and linguistic needs.

SCOPE AND SEQUENCE

(Pacing Guide)

Unit of Study	Estimated Time
<i>Unit 1 Operations on Decimals and Numerical Expressions</i>	10 weeks
<i>Unit 2 Decimal Multiplication & Division and Volume Concepts</i>	11 weeks

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<i>Unit 3 Fractions</i>	11 weeks
<i>Unit 4 The Coordinate System and Classifying Two-Dimensional Figures</i>	4 weeks

UNIT

Unit 1: Operations on Decimals and Numerical Expressions

UNIT SUMMARY

In this unit, students will...

A focus of unit 1 is to understand place value to the thousandths place. This concept builds on students' grade 4 understandings of decimals to the hundredths place. After examining the quantitative relationships that exist between the digits in place value positions of a multi-digit number, learners apply their previous understandings of adding and subtracting to add and subtract decimals.

While learners read, write, and compare decimals to the thousandths place using base-ten numerals, number names, and expanded form, the focus of this unit is addition and subtraction of decimals to the hundredths place. The additional and supporting concepts and skills engage learners in analyzing the structure of numerical expressions. Learners evaluate and write numerical expressions with grouping symbols, write numerical expressions from a description, and interpret numerical expressions.

Note: Double asterisks (**) indicate that the example(s) included within the New Jersey Student Learning Standard may be especially informative when considering the Student Learning Objective.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

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 $\frac{1}{10}$ of what it represents in the place to its left.

5.NBT.A.3 Read, write, and compare decimals to thousandths.

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-Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

-Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

5.NBT.A.4 Use place value understanding to round decimals to any place.

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8+7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.*

5.NBT.B.7 *Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.*

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- Science

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved

New Jersey Student Learning Standards- Language Arts

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

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

NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

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New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills (2020)

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse objectives to expand one’s thinking about a topic of curiosity

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process

9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem

9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue

21st CENTURY LIFE AND CAREER STANDARDS

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

9.1: Personal Financial Literacy

- A. Civic Responsibility
- B. Financial Institutions
- C. Financial Psychology
- D. Planning and Budgeting
- E. Risk Management and Insurance
- F. Civic Financial Responsibility
- G. Credit Profile

9.2: Career Awareness, Exploration & Preparation, and Training

- A. Career Awareness (K-2)
- B. Career Awareness and Planning (3-5)
- C. Career Awareness and Planning (6-8)
- D. Career Awareness and Planning (9-12)

9.3: Career and Technical Education

- A. Agriculture
- B. Architecture
- C. Arts,A/V, Technology
- D. Business Management
- E. Education
- F. Finance
- G. Government
- H. Health Science
- I. Hospital & Tourism

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<p>H. Economic and Government Influences</p> <p>I. Credit and Debt Management</p>	<p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>E. Information and Media Literacy</p> <p>F. Technology Literacy</p>	<p>J. Human Services</p> <p>K. Information Tech.</p> <p>L. Law and Public Safety</p> <p>M. Manufacturing</p> <p>N. Marketing</p> <p>O. Science, Technology, Engineering & Math</p> <p>P. Trans./Logistics</p>
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TECHNOLOGY STANDARDS

8.1: Computer Science

- A. Computing systems
- B. Networks and the Internet
- C. Impacts of Computing
- D. Data & Analysis
- E. Algorithms & Programming

8.2 Design Thinking

- A. Engineering Design
- B. Interaction of Technology and Humans
- C. Nature of Technology
- D. Effects of Technology on the Natural World
- E. Ethics & Culture

ENDURING UNDERSTANDINGS

- when the value in a place exceeds the limit, it must change places.
- 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.
- use the order of operations to find answers to expressions
- place-value understanding is needed to round decimals to any place.
- know the place value to examine in order to round numbers, including decimals.
- read and write decimals to thousandths using base-ten numerals, number names, and expanded form.

ESSENTIAL QUESTIONS

- Why is there an order to follow to compute answers?
- How does the location of a number in a place value system affect the value of a number?
- How is place value used to round numbers?
- What is the significance of the decimal point?

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- compare two decimals to thousandths.
- use $>$, $=$, and $<$ symbols to record the results of comparisons.
- write simple expressions that record calculations with numbers.
- interpret numerical expressions without evaluating them the order of operations is as follows:

-parentheses

-exponents

-multiplication and division,
left to right

-addition and subtraction, left
to right.

- multi-digit computation is just an extension of single-digit computations.
- fluently multiply multi-digit whole numbers using the standard algorithm.
- find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.
- illustrate and explain calculations by using equations, rectangular arrays, and/or area models.
- add, subtract, multiply, and divide decimals to hundredths.

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- recognize in a multi-digit number that a digit is 10 times the value of the digit to its right
- recognize in a multi-digit number that a digit is $1/10$ the value of the digit to its left
- read decimals to thousandths using base-ten numerals, number names, and expanded form

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- write decimals to thousandths using base-ten numerals, number names, and expanded form
- compare two decimals to thousandths based on place value understanding
- record comparisons of two decimals to thousandths using $>$, $<$ or $=$
- round decimals to any place using place value understanding
- add and subtract decimals to hundredths using concrete models or drawings
- add and subtract decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction
- relate the strategy to the concrete model or drawing, and explain the reasoning used
- evaluate numerical expressions with parentheses, brackets, and braces, including expressions containing fractions and decimals)
- use parentheses, brackets, or braces to group parts of a numerical expression
- write simple numerical expressions from a description that record calculations with numbers
- interpret numerical expressions to compare their values without evaluating them

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

- Classroom Discussion
- Exit Slip
- Checklists
- Peer Assessment
- Vocabulary Quizzes
- Rubrics
- Participation and teacher observation
- Mini Whiteboard Responses
- Think-Pair-Share
- Concept Map
- Classroom Poll
- Interactive activities

Summative Assessment:

- Unit Tests
- End-of-Book Test
- NJSLA Test

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<p>Benchmark Assessment:</p> <ul style="list-style-type: none"> ● iReady Benchmark ● Unit Benchmarks 	<p>Alternative Assessments:</p> <ul style="list-style-type: none"> ● Project ● Portfolio 	
INSTRUCTIONAL RESOURCES		
<p>Core Instructional Resource:</p> <ul style="list-style-type: none"> ● HMH Into Math ● Achieve the Core 	<p>Teacher Created Materials:</p> <p>Presentations</p>	<p>Supplemental Resources:</p> <ul style="list-style-type: none"> ● ● Desmos ● ● Khan Academy ● Woot Math <p>https://www.sheppardsoftware.com/</p> <p>https://mrnussbaum.com/</p> <p>https://www.mathsisfun.com/</p> <p>https://achievethecore.org/</p> <p>https://nrich.maths.org/</p> <p>https://nj.digitalitemlibrary.com/home</p> <p>https://illustrativemathematics.org/</p> <p>https://illuminations.nctm.org/</p> <p>https://apps.mathlearningcenter.org/number-pieces/</p> <p>https://www.commoncoreheats.com/</p> <ul style="list-style-type: none"> ● Math Antics ● Xtra math
INTEGRATED ACCOMMODATIONS AND MODIFICATIONS		
<p>Special Education:</p> <p>Provide modified notes and access to extra copies online</p> <p>Provide oral reminders and check student work during independent work time</p> <p>Model skills/techniques to be mastered</p> <p>Check and sign assignment planner</p> <p>Preferential seating</p>		

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Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

English Learners:

Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:

Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

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UNIT

Unit 2: Decimal Multiplication & Division and Volume Concepts

UNIT SUMMARY

In this unit, students will...

This unit focuses on the concepts of volume, decimal multiplication and division, and fluency with whole number multiplication. The unit begins with learners analyzing and explaining patterns in the number of zeros and the placement of the decimal point in the context of multiplying by powers of 10. They continue work building fluency with multiplication of whole numbers using the standard algorithm. These concepts lay the foundation for introducing learners to multiplication of decimals to hundredths. As with other operations, learner represent these concepts with models and drawings, before using other various strategies. Similarly, learners divide whole numbers and use concrete models, drawings, and various strategies to divide decimals to hundredths

In the final module of this unit, learners build upon earlier work in grade 3 tiling rectangular figures to develop the concept of area. Now in grade 5, learners pack rectangular prisms with unit cubes to develop the concept of volume. They recognize volume as an attribute of solid figures, understand foundational concepts of volume measurement, and measure volumes by counting unit cubes of various standard and non-standard units. They relate volume to the operations of multiplication and addition and solve real world and mathematical problems by applying volume formulas $V = l \times w \times h$ and $V = B \times h$ to rectangular prisms with whole number edge lengths. To conclude the unit, learners recognize volume as additive and use the concept to determine volumes of composite solid figures composed of right rectangular prisms.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

5.NBT.A2 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.B5 Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.B6 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.

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5.NBT.B7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used

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.

5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

-A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

-A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.

5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and non-standard units.

5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

-Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

-Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.

-Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

INTERDISCIPLINARY CONNECTIONS

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3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

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9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem

9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue

21st CENTURY LIFE AND CAREER STANDARDS

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1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

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<p>9.1: Personal Financial Literacy</p> <p>J. Civic Responsibility</p> <p>K. Financial Institutions</p> <p>L. Financial Psychology</p> <p>M. Planning and Budgeting</p> <p>N. Risk Management and Insurance</p> <p>O. Civic Financial Responsibility</p> <p>P. Credit Profile</p> <p>Q. Economic and Government Influences</p> <p>R. Credit and Debt Management</p>	<p>9.2: Career Awareness, Exploration & Preparation, and Training</p> <p>G. Career Awareness (K-2)</p> <p>H. Career Awareness and Planning (3-5)</p> <p>I. Career Awareness and Planning (6-8)</p> <p>J. Career Awareness and Planning (9-12)</p> <p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>K. Information and Media Literacy</p> <p>L. Technology Literacy</p>	<p>9.3: Career and Technical Education</p> <p>Q. Agriculture</p> <p>R. Architecture</p> <p>S. Arts,A/V, Technology</p> <p>T. Business Management</p> <p>U. Education</p> <p>V. Finance</p> <p>W. Government</p> <p>X. Health Science</p> <p>Y. Hospital & Tourism</p> <p>Z. Human Services</p> <p>AA. Information Tech.</p> <p>BB. Law and Public Safety</p> <p>CC. Manufacturing</p> <p>DD. Marketing</p> <p>EE. Science, Technology, Engineering & Math</p> <p>FF. Trans./Logistics</p>
TECHNOLOGY STANDARDS		
<p>8.1: Computer Science</p> <p>A. Computing systems</p> <p>B. Networks and the Internet</p> <p>C. Impacts of Computing</p> <p>D. Data & Analysis</p> <p>E. Algorithms & Programming</p>	<p>8.2 Design Thinking</p> <p>A. Engineering Design</p> <p>B. Interaction of Technology and Humans</p> <p>C. Nature of Technology</p> <p>D. Effects of Technology on the Natural World</p> <p>E. Ethics & Culture</p>	
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	
<ul style="list-style-type: none"> ● multi-digit computation is just an extension of single-digit computations. ● fluently multiply multi-digit whole numbers using the standard algorithm. 	<ul style="list-style-type: none"> ● Why would one need to convert measurements from one unit to another? ● How does one know whether the new answer should be a bigger or smaller number of units? 	

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|--|--|
| <ul style="list-style-type: none">• find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.• illustrate and explain calculations by using equations, rectangular arrays, and/or area models.• add, subtract, multiply, and divide decimals to hundredths.• every step in the metric system involves a power of 10, e.g. 10 cm = 1 decimeter, 10 mm = 1 cm, etc.) customary equivalents.• convert among different-sized standard measurement units within a given measurement system.• solve real-world problems involving conversions.• a cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.• a solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.• measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.• solve real world and mathematical problems involving volume.• apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.• find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts.• describe patterns in zeros when multiplying a whole numbers by a power of 10 | <ul style="list-style-type: none">• For what types of items can we measure volume? |
|--|--|

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- describe the result of multiplying and dividing decimals by powers of 10

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- explain patterns in the number of zeros of the product when multiplying by powers of 10
- explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10
- denote powers of 10 by using whole-number exponents
- convert among different-sized standard measurement units within a given measurement system
- use conversions in solving multi-step, real world problems
- multiply multi-digit whole numbers using the standard algorithm working towards accuracy and efficiency
- multiply decimals to hundredths using models or drawings
- multiply decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction
- relate the strategy to the concrete model or drawing, and explain the reasoning used
- find whole-number quotients with up to four-digit dividends and two-digit divisors using strategies based on place value
- find whole-number quotients with up to four-digit dividends and two-digit divisors using strategies based on properties of operations or the relationship between multiplication and division
- illustrate and explain the division calculation by using equations, rectangular arrays, and/or area models
- divide decimals to hundredths using models or drawings
- divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction
- relate the strategy to the concrete model or drawing, and explain the reasoning used
- a cube with side length 1 unit is called a “unit cube”, has “one cubic unit” of volume, and can be used to measure volume
- a solid figure which can be packed without gaps or overlaps using (n) unit cubes has a volume of n cubic units
- measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and non-standard units
- find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths
- represent volumes as the product of three whole numbers
- apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems

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- recognize volume as additive and find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

- Classroom Discussion
- Exit Slip
- Checklists
- Peer Assessment
- Vocabulary Quizzes
- Rubrics
- Participation and teacher observation
- Mini Whiteboard Responses
- Think-Pair-Share
- Concept Map
- Classroom Poll
- Interactive activities

Summative Assessment:

- Unit Tests
- End-of-Book Test
- NJSLA Test

Benchmark Assessment:

- iReady Benchmark
- Unit Benchmarks

Alternative Assessments:

- Project
- Portfolio

INSTRUCTIONAL RESOURCES

*Core Instructional Resource:

- HMH Into Math
- Achieve the Core

Teacher Created Materials:

Presentations

Supplemental Resources:

-
- Desmos
-
- Khan Academy

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		<ul style="list-style-type: none">● Woot Math https://www.sheppardsoftware.com/ https://mrnussbaum.com/ https://www.mathsisfun.com/ https://achievethecore.org/ https://nrich.maths.org/ https://nj.digitalitemlibrary.com/home https://illustrativemathematics.org/ https://illuminations.nctm.org/ https://apps.mathlearningcenter.org/number-pieces/ https://www.commoncoreheets.com/● Math Antics● Xtra math
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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:

Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

English Learners:

Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers

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Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:

Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT

Unit 3: *Fractions*

UNIT SUMMARY

In this unit, students will...

Unit 3 focuses on fraction ideas and introduces a number of fractions concepts. Learners build upon many fraction concepts developed in earlier grades. They use fraction equivalence from grades 3 and 4 to add and subtract fractions with unlike denominators. Learners solve word problems involving addition and subtraction of fractions, using benchmark fractions and number sense of fractions to estimate mentally and to assess the reasonableness of their answers.

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Next, learners extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. Building on their grade 3 work with area, they find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. They show that the area is the same as would be found by multiplying the side lengths and represent fraction products as rectangular areas.

In the final module of this unit, learners build upon earlier work with multiplication and division. They interpret multiplication as scaling and compare the size of the product to the size of the factors. They come to understand and explain that multiplying a given factor by a number greater than 1 leads to a product that is greater than the given factor. Learners solve real world problems involving multiplication of fractions and represent problems using visual fraction models and equations.

To conclude this unit, learners are introduced to a new interpretation of fraction. They interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). They solve word problems involving division of whole numbers that lead to answers in fraction form. Learners then extend these previous understandings of division to divide unit fractions by whole numbers and to divide whole numbers by unit fractions.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

5.NF.A1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)*

5.NF.A2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.*

5.NF.B3 Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

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5.NF.B4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- A. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)*
- B. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.B5 Interpret multiplication as scaling (resizing), by:

- A. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- B. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

5.NF.B6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NF.B7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.¹

- A. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.*
- B. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.*
- C. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$ -cup servings are in 2 cups of raisins?*

¹ Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

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5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- Science

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved

New Jersey Student Learning Standards- Language Arts

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

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

NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills (2020)

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse objectives to expand one's thinking about a topic of curiosity

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process

9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem

9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue

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21st CENTURY LIFE AND CAREER STANDARDS

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

<p>9.1: Personal Financial Literacy</p> <p>S. Civic Responsibility</p> <p>T. Financial Institutions</p> <p>U. Financial Psychology</p> <p>V. Planning and Budgeting</p> <p>W. Risk Management and Insurance</p> <p>X. Civic Financial Responsibility</p> <p>Y. Credit Profile</p> <p>Z. Economic and Government Influences</p> <p>AA. Credit and Debt Management</p>	<p>9.2: Career Awareness, Exploration & Preparation, and Training</p> <p>M. Career Awareness (K-2)</p> <p>N. Career Awareness and Planning (3-5)</p> <p>O. Career Awareness and Planning (6-8)</p> <p>P. Career Awareness and Planning (9-12)</p> <p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>Q. Information and Media Literacy</p> <p>R. Technology Literacy</p>	<p>9.3: Career and Technical Education</p> <p>GG. Agriculture</p> <p>HH. Architecture</p> <p>II. Arts, A/V, Technology</p> <p>JJ. Business Management</p> <p>KK. Education</p> <p>LL. Finance</p> <p>MM. Government</p> <p>NN. Health Science</p> <p>OO. Hospital & Tourism</p> <p>PP. Human Services</p> <p>QQ. Information Tech.</p> <p>RR. Law and Public Safety</p> <p>SS. Manufacturing</p> <p>TT. Marketing</p> <p>UU. Science, Technology, Engineering & Math</p> <p>VV. Trans./Logistics</p>
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TECHNOLOGY STANDARDS	
<p>8.1: Computer Science</p> <ul style="list-style-type: none"> A. Computing systems B. Networks and the Internet C. Impacts of Computing D. Data & Analysis E. Algorithms & Programming 	<p>8.2 Design Thinking</p> <ul style="list-style-type: none"> A. Engineering Design B. Interaction of Technology and Humans C. Nature of Technology D. Effects of Technology on the Natural World E. Ethics & Culture
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
<ul style="list-style-type: none"> ● that a common denominator is a common multiple of the two denominators (usually the least common one). ● that when adding fractions, the common denominators do not get added together, only the numerators do. ● add and subtract fractions with unlike denominators (including mixed numbers). ● solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. ● use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. ● the relative size of the answer based on the sizes of the factors. ● solve word problems involving division of whole numbers. ● multiply a fraction or whole number by a fraction. ● find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. ● show that the area from tiles is the same as would be found by multiplying the side lengths. 	<ul style="list-style-type: none"> ● When would one use addition or subtraction of fractions? ● What does it mean to divide by a fraction? ● Why would one need to divide by a fraction? ● What types of data can be graphed on a line plot with a fractional scale?

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- multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
- solve real world problems involving multiplication of fractions and mixed numbers.
- divide unit fractions by whole numbers and whole numbers by unit fractions.
- interpret division of a unit fraction by a non-zero whole number.
- interpret division of a whole number by a unit fraction.
- solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.
- make a line plot to display a data set of measurements in fractions of a unit ($1/2$, $1/4$, $1/8$).
- use operations on fractions for this grade to solve problems involving information presented in line plots.

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- when adding or subtracting fractions, replacing given fractions with equivalent fraction produces an equivalent sum or difference of fractions with like denominators
- add and subtract fractions with unlike denominators, including mixed numbers, by replacing given fractions with equivalent fraction
- solve word problems involving addition and subtraction of fractions including those with unlike denominators referring to the same whole
- benchmark fractions and number sense can be used in estimating and assessing the reasonableness of answers to word problems involving addition and subtraction of fractions
 - apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction
 - interpret the product $(a/b) \times q$ as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$ **
 - interpret the product of a fraction and a fraction as $(a/b) \times (c/d) = ac/bd$ **
 - tile a rectangle using the appropriate fractional unit square in order to find the area of a rectangle that has fractional side lengths

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- show that the area found by tiling would be that same as multiplying the side lengths
- multiply fractional side lengths to find areas of rectangles
- represent fraction products as rectangular areas
- interpret multiplication as scaling (resizing) by comparing the size of a product to the size of one factor without performing the multiplication
- explain why multiplying a given number by a fraction greater than one results in a product greater than one and why multiplying a given number by a fraction less than one results in a product smaller than the given number
- multiplying a fraction a/b by n/n ($a/b = (n \times a)/(n \times b)$) has the same effect as multiplying a/b by 1 and creates an equivalent fraction
- real world problems involving multiplication of fractions and mixed numbers
- interpret a fraction as division of the numerator by the denominator using visual fraction models or equations
- solve word problems involving division of whole numbers resulting in a fraction or mixed number quotient
- compute and interpret the quotients of a unit fraction by a non-zero whole number**
- compute and interpret the quotients of a non-zero whole number by a unit fraction**
- solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions**
- make a line plot to display a data set of measurements in fractions of a unit ($1/2$, $1/4$, $1/8$)
- use operations with fractions to solve problems involving information presented in line plots

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

- Classroom Discussion
- Exit Slip
- Checklists
- Peer Assessment
- Vocabulary Quizzes

Summative Assessment:

- Unit Tests
- End-of-Book Test
- NJSLA Test

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<ul style="list-style-type: none"> ● Rubrics ● Participation and teacher observation ● Mini Whiteboard Responses ● Think-Pair-Share ● Concept Map ● Classroom Poll ● Interactive activities 		
<p>Benchmark Assessment:</p> <ul style="list-style-type: none"> ● iReady Benchmark ● Unit Benchmarks 	<p>Alternative Assessments:</p> <ul style="list-style-type: none"> ● Project ● Portfolio 	
<p>INSTRUCTIONAL RESOURCES</p>		
<p>Core Instructional Resource:</p> <ul style="list-style-type: none"> ● HMH Into Math ● Achieve the Core 	<p>Teacher Created Materials: Presentations</p>	<p>Supplemental Resources:</p> <ul style="list-style-type: none"> ● ● Desmos ● ● Khan Academy ● Woot Math <p>https://www.sheppardsoftware.com/</p> <p>https://mrnussbaum.com/</p> <p>https://www.mathsisfun.com/</p> <p>https://achievethecore.org/</p> <p>https://nrich.maths.org/</p> <p>https://nj.digitalitemlibrary.com/home</p> <p>https://illustrativemathematics.org/</p> <p>https://illuminations.nctm.org/</p> <p>https://apps.mathlearningcenter.org/number-pieces/</p> <p>https://www.commoncoresheets.com/</p> <ul style="list-style-type: none"> ● Math Antics ● Xtra math

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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:

Provide modified notes and access to extra copies online
Provide oral reminders and check student work during independent work time
Model skills/techniques to be mastered
Check and sign assignment planner
Preferential seating
Pair visual prompts with verbal presentations
Modified or scaffolded homework and classwork
Extended time as needed
Provide graphic organizers and study guides

English Learners:

Provide scaffolded assignments and assessments
Pair visual prompts with visual presentations
Check and sign assignment planner
Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
Extended time for assignment and assessment as needed
Highlight key vocabulary
Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:

Check and sign assignment planner
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Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans

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Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers

UNIT

Unit 4: The Coordinate System and Classifying Two-Dimensional Figures

UNIT SUMMARY

In this unit, students will...

The focus of Unit 4 is defining a coordinate system and understanding the relationship between coordinates and axes. Learners define the first quadrant of the coordinate system and represent real world and mathematical problems by graphing points in that quadrant. Learners also form ordered pairs that they have generated using two given rules to generate two numerical patterns using two given rules. They analyze and identify apparent relationships between corresponding terms. After revisiting their earlier work writing simple numerical expressions, learners extend their understanding of classifying figures into categories to understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. They use this new understanding of categories and subcategories to classify two-dimensional figures in a hierarchy based on their properties.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x -axis and x -coordinate, y -axis and y -coordinate).

5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

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5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

5.OA.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. *For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.*

5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- Science

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

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New Jersey Student Learning Standards- Language Arts

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New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills

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(2020)

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions

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9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process

9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem

9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue

21st CENTURY LIFE AND CAREER STANDARDS

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1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

9.1: Personal Financial Literacy	9.2: Career Awareness, Exploration & Preparation, and Training	9.3: Career and Technical Education
BB. Civic Responsibility	S. Career Awareness (K-2)	WW. Agriculture
CC. Financial Institutions	T. Career Awareness and Planning (3-5)	XX. Architecture
DD. Financial Psychology	U. Career Awareness and Planning (6-8)	YY. Arts, A/V, Technology
EE. Planning and Budgeting	V. Career Awareness and Planning (9-12)	ZZ. Business Management
FF. Risk Management and Insurance		AAA. Education
GG. Civic Financial Responsibility		BBB. Finance
HH. Credit Profile		CCC. Government
		DDD. Health Science
		EEE. Hospital & Tourism

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<p>II. Economic and Government Influences</p> <p>JJ. Credit and Debt Management</p>	<p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>W. Information and Media Literacy</p> <p>X. Technology Literacy</p>	<p>FFF. Human Services</p> <p>GGG. Information Tech.</p> <p>HHH. Law and Public Safety</p> <p>III. Manufacturing</p> <p>JJJ. Marketing</p> <p>KKK. Science, Technology, Engineering & Math</p> <p>LLL. Trans./Logistics</p>
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TECHNOLOGY STANDARDS

8.1: Computer Science

- A. Computing systems
- B. Networks and the Internet
- C. Impacts of Computing
- D. Data & Analysis
- E. Algorithms & Programming

8.2 Design Thinking

- A. Engineering Design
- B. Interaction of Technology and Humans
- C. Nature of Technology
- D. Effects of Technology on the Natural World
- E. Ethics & Culture

ENDURING UNDERSTANDINGS

- generate patterns from other patterns.
- graph ordered pairs generated by the pattern on a coordinate plane.
- in order to determine if there is a pattern present in a set of numbers, one can look for constant change between the variables.
- the characteristics of figures.
- classify two-dimensional figures in a hierarchy based on properties.
- a pair of perpendicular number lines, called axes, define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line.
- a given point in the plane is located by using an ordered pair of numbers, called its coordinates.

ESSENTIAL QUESTIONS

- Why is there an order to follow to compute answers?
- How are the coordinate points related to patterns?
- Why would one graph on a coordinate plane?
- How does one classify two-dimensional figures?
- Why would one need to classify a two-dimensional figure?
- How are the coordinate points related to patterns?

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- the names of the two axes and the coordinates correspond (e.g., x -axis and x -coordinate, y -axis and y -coordinate).
- graph points in the coordinate plane.
- represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane.
- use the order of operations to find answers to expressions
- write simple expressions that record calculations with numbers
- interpret numerical expressions without evaluating them

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- a coordinate system is defined by a pair of perpendicular lines called axes with the intersection of the lines, the origin, occurring at 0 on each line
- a given point in the coordinate plane is located using an ordered pair of numbers called coordinates
- the first number in an ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis.
- the names of the two axes and the coordinates correspond (e.g., x -axis and x -coordinate, y -axis and y -coordinate)
 - represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane
 - interpret coordinate values of points in the context of the real world and mathematical problems
- generate two numerical patterns using two given rules and identify relationships between corresponding terms in the patterns
 - form ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on a coordinate plane
 - evaluate numerical expressions with parentheses, brackets, and braces, including expressions containing fractions and decimals)
 - use parentheses, brackets, or braces to group parts of a numerical expression
 - write simple numerical expressions from a description that record calculations with numbers
 - interpret numerical expressions to compare their values without evaluating them

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- the attributes belonging to a category of two-dimensional figures also belong to all subcategories
- classify two-dimensional figures in a hierarchy based on properties

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

- Classroom Discussion
- Exit Slip
- Checklists
- Peer Assessment
- Vocabulary Quizzes
- Rubrics
- Participation and teacher observation
- Mini Whiteboard Responses
- Think-Pair-Share
- Concept Map
- Classroom Poll
- Interactive activities

Summative Assessment:

- Unit Tests
- End-of-Book Test
- NJSLA Test

Benchmark Assessment:

- iReady Benchmark
- Unit Benchmarks

Alternative Assessments:

- Project
- Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:

- HMH Into Math

Teacher Created Materials:

Presentations

Supplemental Resources:

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<ul style="list-style-type: none"> ● Achieve the Core 	<ul style="list-style-type: none"> ● Desmos ● Khan Academy ● Woot Math <p> https://www.sheppardsoftware.com/ https://mrnussbaum.com/ https://www.mathsisfun.com/ https://achievethecore.org/ https://nrich.maths.org/ https://nj.digitalitemlibrary.com/home https://illustrativemathematics.org/ https://illuminations.nctm.org/ https://apps.mathlearningcenter.org/number-pieces/ https://www.commoncoreheats.com/ </p> <ul style="list-style-type: none"> ● Math Antics ● Xtra math
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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:

- Provide modified notes and access to extra copies online
- Provide oral reminders and check student work during independent work time
- Model skills/techniques to be mastered
- Check and sign assignment planner
- Preferential seating
- Pair visual prompts with verbal presentations
- Modified or scaffolded homework and classwork
- Extended time as needed
- Provide graphic organizers and study guides

English Learners:

- Provide scaffolded assignments and assessments
- Pair visual prompts with visual presentations
- Check and sign assignment planner
- Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment and assessment as needed
- Highlight key vocabulary

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Use graphic organizers
Provide verbal and written directions
Preferential seating with a English-speaking peer

At Risk of Failure:

Check and sign assignment planner
Encourage class participation and reinforce skills
Model skills and assignments
Extended to time to complete class work
Preferential seating
Provide extra help outside of class and 1:1 instruction when needed
Communicate regularly with students' other teachers
Provide positive feedback for tasks well done
Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions
Provide higher level reading and writing materials for literacy based activities
Probe student to extend thinking beyond the text or connect two or more texts
Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed
Modify length of writing assignment
Provide short breaks within the lesson
Provide scaffolding for students
Utilize graphic organizers