BUTLER SCHOOL DISTRICT

Grade 4 Mathematics Curriculum

Authored by:
Kristy Ricker
Nicole Neumann

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

Reviewed by:
Dr. Daniel R. Johnson, Superintendent
Margaret Lynch, Supervisor of STEAM

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34 Bartholdi Avenue
Butler, NJ 07405
www.butlerboe.org

VISION

The Butler School District's Mathematics Department's objective is to prepare students to think critically, innovate, communicate, and collaborate in an ever-changing world. The Mathematics curriculum provides students with quality, rigorous instruction to help them become better **problem solvers, troubleshooters, and analytical thinkers**. The rich, educational experience provided within the Butler School District will produce young adults with the foundation and expertise they need for the future. It is the goal to challenge each student to develop and extend mathematical proficiency through highest quality mathematics teaching and standard-based assessments that meet the learning needs of each student. Butler Mathematics students will become individuals who persevere in their pursuit of lifelong learning through a culture that appreciates the beauty and usefulness of math.

As a result of a Butler 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.
- 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

COURSE OVERVIEW

This is the 4th grade mathematics course. This course focuses on place value, multiplication & division, fraction & decimal notation, and geometry. The Standards for Mathematical Practice are incorporated in each unit to ensure students are developing procedural fluency, problem solving skills, and productive dispositions towards Mathematics.

GOALS

New Jersey Student Learning Standards Mathematics

ASSESSMENT

Student learning will be assessed through a variety of formative, summative, benchmark, and alternative assessments.

SCOPE AND SEQUENCE
(*Pacing Guide*)

Unit of Study	**Estimated Time**
Place Value and Operations with Whole Numbers	9 weeks
Multi-digit Multiplication and Division & Fraction Equivalence	10 weeks

Building Fractions & Decimal Notation	11 weeks
Geometry and Measurement	6 weeks

AFFIRMATIVE ACTION COMPLIANCE STATEMENT

The Butler 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.

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.

21ST CENTURY THEMES & SKILLS

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

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.

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.

DIVERSITY AND INCLUSION

In alignment with the 2020 NJSLS, the Mathematics Curriculum materials will:

Cultivate respect towards minority groups to foster appreciation of their differences as well as their contributions to the advancement of mathematics

Analyze and appreciate the diverse contributions made in the past (scientifically, economically, politically, and socially) at both the state and federal level as exemplified through mathematics

Examine grade-level texts and resources that simultaneously highlight mathematics as well as the contributions made to it by those of different genders, ethnicities, and abilities.

Employ mathematics as a means of communication — whether in regard to empathy, inclusivity, or advocacy — in an effort to creatively inspire solutions for those with specific needs.

Engage in authentic learning experiences that motivate the acquisition and application of varied perspectives in mathematics

Facilitate the ability to communicate effectively through mathematics while applying content knowledge, interdisciplinary connections, and thinking skills to do so.

Foster active student participation in an inclusive culture that honors mathematicians of all genders, ethnicities, and abilities.

Analyze and develop an understanding of how scientific, economic, political, social, and cultural aspects of society influence new technological and mathematical processes.

Reflect on both personal and non-personal experiences aimed to promote empathy and inclusivity for all regardless of our differences.

UNIT 1
Place Value and Operations with Whole Numbers
UNIT SUMMARY
Unit 1 builds on learners' prior knowledge of place value, teaching students to represent any whole number using base-ten numerals, number names, and expanded form, and round to any place value. Grade 4 learners will deepen their understanding of multiplication through the introduction of factor pairs, and will determine whether one whole number is a multiple of another one-digit number. Students will expand on their word problem solving skills, and learn to solve word problems for which the remainder must be interpreted. Students will represent word problems using equations with a variable, and will use mental computation and estimation to check with validity of their answers. Students will become fluent with the standard algorithm for addition and subtraction for any multi-digit number, in grade 4.
NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS
Module A: **4.NBT.A.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* **4.NBT.A.2** Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Module B:

4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

4.OA.B.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student learning Standards- English Language Arts:

RI.4.1. Refer to details and examples in a text and make relevant connections when explaining
he text says explicitly and when drawing inferences from the text.

RI.4.2. Determine the main idea of a text and explain how it is supported by key details;
arize the text.

RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical
ncluding what happened and why, based on specific information in the text.

RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs,
ms, time lines, animations, or interactive elements on Web pages) and explain how the
nation contributes to an understanding of the text in which it appears.

New Jersey Student Learning Standards- Science 2020:

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of ering or the rate of erosion by water, ice, wind, or vegetation.
4-ESS2-1 Analyze and interpret data from maps to describe patterns of Earth's features.

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 perspectives to d 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

2020 New Jersey Student Learning Standards – Computer Science and Design Thinking
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.
8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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	**9.2: Career Awareness, Exploration & Preparation, and Training**	**9.3: Career and Technical Education**
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 H. Economic and Government Influences I. Credit and Debt Management	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) **9.4 Life Literacies and Key Skills** A. Creativity and Innovation **B Critical Thinking and Problem-solving** C. Digital Citizenship D. Global and Cultural Awareness E. Information and Media Literacy **F. Technology Literacy**	A. Agriculture B. Architecture C. Arts,A/V, Technology D. Business Management **E. Education** F. Finance G. Government H. Health Science I. Hospital & Tourism J. Human Services K. Information Tech. L. Law and Public Safety M. Manufacturing N. Marketing **O. Science, Technology, Engineering & Math** P. Trans./Logistics

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	**ESSENTIAL QUESTIONS**
Place value is important to understand the meaning of numbers when performing mathematical operations.	Why is place value important? How does rounding/estimating help us solve math equations?

Estimation allows learners to check the validity of their problem solving. Every counting number is divisible by 1 and itself, and some counting numbers are also divisible by other numbers. Divisibility rules are helpful. Some numbers have exactly two factors, 1 and itself. These are prime numbers. Some numbers have more than two factors. These are composite numbers. The product of any nonzero number and any other nonzero number is divisible by each number and called a multiple of each number. A product is the result of multiplying numbers that are called factors. There is more than one way to estimate a sum, difference, product or quotient. Each estimation technique gives a way to replace numbers with other numbers that are close and easy to compute with mentally. Rounding is one way to estimate answers. It involves replacing numbers with the closest multiple (or power, if appropriate) of 10 or 100. Mathematical situations can be represented with equations using letters for the unknown quantity which may appear in any position. When dividing the remainder must be less than the divisor. The nature of the question asked determines how to interpret and use the remainder.	How can patterns and properties be used in finding factor pairs for whole numbers in the range of 1-100? What is the difference between factors and multiples? How can one determine whether a number is prime or composite? How do we solve multi-step problems with whole numbers using the four operations? What are strategies for assessing the reasonableness of answers? What are ways to represent problems using equations with letters standing for the unknown in any place? What strategies are most helpful for solving particular problems?
STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)	
Students are learning to/that… ● Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	

- Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form.
- Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- Use place value understanding to round multi-digit whole numbers to any place.
- Interpret a multiplication equation as a comparison. (i.e. Interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.
- Multiply or divide to solve word problems involving multiplicative comparison.
- Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity.
- Assess for reasonableness using computation and estimation strategies including rounding.
- Find all factor pairs for a whole number in the range 1–100.
- Recognize that a whole number is a multiple of each of its factors.
- Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.
- Determine whether a given whole number in the range 1–100 is prime or composite

SUGGESTED ACTIVITIES

- Learning Centers
- Manipulatives
- Tiered Lessons
- Project based Learning
- Pictorial Representations
- Problems of the Day
- Educational Websites such as, but not limited to:
    - Nearpod
    - Khan Academy
    - ST Math
    - IXL
- N.OA.B Identifying Multiples
- 4.OA.B Numbers in a Multiplication Table
- 4.OA.C.5 Double Plus One
- 4.MD.A.1 Who is the tallest?
- 4.OA.A.2 Comparing Money Raised
- 4.NBT.A.1 Thousands and Millions of Fourth Graders
- 4.NBT.A.2 Ordering 4-digit numbers
- 4.NBT.A.3 Rounding on the Number Line

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	**Summative Assessment:** Unit Tests End-of-Book Test NJSLA Test
Benchmark Assessment: Star 360 Benchmark Unit Benchmarks	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:	**Teacher Created materials:**	**Supplemental Resources:**
EnVision by SAVVAS	Nearpod Presentations	● Nearpod ● IXL ● ST Math ● Khan Academy ● Kahoot ● Choice Boards

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
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 2
Multi-digit Multiplication and Division & Fraction Equivalence
UNIT SUMMARY
In this unit, students will focus on multi-digit numbers while extending their work with multiplication and division. They work with four-digit dividends and one-digit divisors to find whole number quotients. They multiply whole numbers up to four digits by a one-digit number and multiply two two-digit numbers. Using strategies based on place value and the properties of operations from grade 3 to multiply and divide, students illustrate and explain their work

using equations, rectangular arrays, and area models. Building on the work of the prior unit – solving word problems that involve multiplicative comparison – students solve multi-step word problems involving the four operations. They represent these problems using equations with variables and they use mental computation and appropriate estimation strategies to determine whether their answers are reasonable.

In the second module of this unit, students extend their grade 3 understandings of fraction equivalence. In grade 3, students determined fraction equivalence by comparing size or by locating fractions at the same point on the number line. They also recognized and generated simple equivalent fractions and used visual fraction models to illustrate their equivalence. In grade 4, students compare the number of parts and the size of the parts when comparing two fractions that are the same size. They use this principle to recognize and generate equivalent fractions.

With the understanding of adding and subtracting fractions as joint and separate parts that refer to the same whole in place, Unit 2 concludes with students decomposing fractions whose numerator is larger than a sum of fractions and justifying these decompositions with visual fraction models.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

Module A

4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-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.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Module B

4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or < .

4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples*: *3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*

INTERDISCIPLINARY CONNECTIONS

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RI.4.1. Refer to details and examples in a text and make relevant connections when explaining
he text says explicitly and when drawing inferences from the text.

RI.4.2. Determine the main idea of a text and explain how it is supported by key details;
arize the text.

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ncluding what happened and why, based on specific information in the text.

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ams, time lines, animations, or interactive elements on Web pages) and explain how the
nation contributes to an understanding of the text in which it appears.

New Jersey Student Learning Standards- Science 2020:

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of
ering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-1 Analyze and interpret data from maps to describe patterns of Earth's features.

4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the energy
of that object.

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 perspectives to d 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

2020 New Jersey Student Learning Standards – Computer Science and Design Thinking
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.
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8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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	**9.2: Career Awareness, Exploration & Preparation,**	**9.3: Career and Technical Education**

J. Civic Responsibility K. Financial Institutions L. Financial Psychology M. Planning and Budgeting N. Risk Management and Insurance O. Civic Financial Responsibility P. Credit Profile Q. Economic and Government Influences R. Credit and Debt Management	**and Training** G. Career Awareness (K-2) **H. Career Awareness and Planning (3-5)** I. Career Awareness and Planning (6-8) J. Career Awareness and Planning (9-12) **9.4 Life Literacies and Key Skills** A. Creativity and Innovation B **Critical Thinking and Problem-solving** C. Digital Citizenship D. Global and Cultural Awareness K. Information and Media Literacy **L. Technology Literacy**	Q. Agriculture R. Architecture S. Arts,A/V, Technology T. Business Management **U. Education** V. Finance W. Government X. Health Science Y. Hospital & Tourism Z. Human Services AA. Information Tech. BB. Law and Public Safety CC. Manufacturing DD. Marketing **EE. Science, Technology, Engineering & Math** FF. Trans./Logistics

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	**ESSENTIAL QUESTIONS**
The inverse relationship between multiplication and division can be used to find all division facts.	How can the inverse relationship between multiplication and division be helpful in knowing all multiplication and division facts through 12 x 12?
There is an expanded algorithm for multiplying where numbers are broken apart using place value and the parts are used to find partial products. The partial products are then added together to find the product.	How can place value strategies, properties of operations and/or the relationship between multiplication and division be used to find whole number quotients and remainders?
The standard division algorithm breaks the calculation into simpler calculations using	How can the same fractional amounts be renamed using equivalent fractions?

basic facts, place value, the relationship between multiplication and division, and estimation. Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value.	What visual models are most useful when determining fraction equivalence?

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

Students are learning to/that…

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Know multiplication facts and related division facts through 12 x 12.

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models.

SUGGESTED ACTIVITIES

- Learning Centers
- Manipulatives
- Tiered Lessons
- Project based Learning
- Pictorial Representations
- Problems of the Day
- Educational Websites such as, but not limited to:
    - Nearpod
    - Khan Academy
    - ST Math
    - IXL
- 4.NBT.B To regroup or not to regroup
- 4.NBT.B.6 mental Division Strategy
- 4.OA.A.3, 4.MD.A.3 Karl's Garden

- 4.NF.A.1 Explaining Fraction Equivalence with Pictures
- 4.NF.A.1 Fractions and Rectangles
- 4.NF.A.2 Comparing Fractions Using Benchmarks Game
- 4.NF.A.2 Doubling Numerators and Denominators
- 4.NF.B.3a Comparing Sums of Unit Fractions
- 4.NF.B.3b making 22 Seventeenths in Different Ways

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

Summative Assessment:
Unit Tests
End-of-Book Test

NJSLA Test

Benchmark Assessment:
Star 360 Benchmark
Unit Benchmarks

Alternative Assessments:
Project
Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:

EnVision

Teacher Created materials:
Nearpod Presentations

Supplemental Resources:

- Nearpod
- IXL
- ST Math
- Khan Academy
- Kahoot
- Choice Boards

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
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 3
Building Fractions & Decimal Notation

UNIT SUMMARY

Unit 3 focuses on early operations with fractions, using visual fraction models to support understanding. The students will begin by adding and subtracting fractions with like denominators, and move on to solving word problems using addition and subtractions of fractions. Learners will practice multiplying fractions by whole numbers and understand that fractions that are not unit fractions are multiples of some basic unit fraction. Students will also express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this method to add two fractions with respective denominators 10 and 100, use decimal notation for fractions with these two denominators, and compare two decimals. Unit 3 concludes with students solving multi step word problems involving distances, intervals of time, liquid volumes, masses of objects, and money. These problems also include simple fractions or decimals, and measurement.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

Module A:

4.NF.B.3 Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*.

c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

d. Solve word problems involving addition and subtraction of fractions, referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

4.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

a. Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (¼), recording the conclusion by the equation 5/4 = 5 × (1/4).*

b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5.*

(In general, n × (a/b) = (n × a)/b.)

c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Module B:

4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*

4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <.

4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; *l*, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*

4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student learning Standards- English Language Arts:

RI.4.1. Refer to details and examples in a text and make relevant connections when explaining
he text says explicitly and when drawing inferences from the text.

RI.4.2. Determine the main idea of a text and explain how it is supported by key details;
arize the text.

RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical
ncluding what happened and why, based on specific information in the text.

RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs,
ams, time lines, animations, or interactive elements on Web pages) and explain how the
nation contributes to an understanding of the text in which it appears.

New Jersey Student Learning Standards- Science 2020:

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of ering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-1 Analyze and interpret data from maps to describe patterns of Earth's features.

4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the y of that object.

4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from rm to another.

New Jersey Student Learning Standards-Social Studies 2020:

6.1.4.C.10 Explain the role of money, savings, debt, and investment in individuals' lives.

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 perspectives to d 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

2020 New Jersey Student Learning Standards – Computer Science and Design Thinking

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.

8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.

8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

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

8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.

8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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	**9.2: Career Awareness, Exploration & Preparation, and Training**	**9.3: Career and Technical Education**
S. Civic Responsibility **T. Financial Institutions** U. Financial Psychology **V. Planning and Budgeting** W. Risk Management and Insurance X. Civic Financial Responsibility Y. Credit Profile Z. Economic and Government Influences **AA. Credit and Debt Management**	M. Career Awareness (K-2) **N. Career Awareness and Planning (3-5)** O. Career Awareness and Planning (6-8) P. Career Awareness and Planning (9-12) **9.4 Life Literacies and Key Skills** A. Creativity and Innovation **B Critical Thinking and Problem-solving** C. Digital Citizenship D. Global and Cultural Awareness Q. Information and Media Literacy **R. Technology Literacy**	GG. Agriculture HH. Architecture II. Arts,A/V, Technology JJ. Business Management **KK. Education** **LL. Finance** MM. Government NN. Health Science OO. Hospital & Tourism PP. Human Services QQ. Information Tech. RR. Law and Public Safety SS. Manufacturing TT. Marketing **UU. Science, Technology, Engineering & Math** VV. Trans./Logistics

TECHNOLOGY STANDARDS

8.1: Computer Science	**8.2 Design Thinking**
A. Computing systems B. Networks and the Internet C. Impacts of Computing **D. Data & Analysis**	A. Engineering Design B. Interaction of Technology and Humans C. Nature of Technology D. Effects of Technology on the Natural World

E. Algorithms & Programming	E. Ethics & Culture
ENDURING UNDERSTANDINGS	**ESSENTIAL QUESTIONS**
Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value. The same fractional amount can be represented by an infinite set of different but equivalent fractions. Equivalent fractions are found by multiplying or dividing the numerator and denominator by the same nonzero number. Numbers, expressions, measures and objects can be compared and related to other numbers, expressions, measures and objects in different ways. Benchmark fractions such as ½ are useful when comparing two fractions to each other. Fraction models such as fraction bars and number lines are useful when determining fraction equivalence. Fractions can be built from unit fractions by applying and extending understandings of operations on whole numbers. When adding or subtracting fractions with like denominators, you are adding or subtracting portions of the same size. So, you can add or subtract the numerators without changing the denominators. One way to add mixed numbers is to add the fractional parts and then add the whole number parts. Sometimes whole numbers or fractions need to be renamed. One way to subtract mixed numbers is to subtract the fractional parts and then the	How can the same fractional amounts be renamed using equivalent fractions? How can fractions be compared and ordered? How can benchmark fractions such as ½ be helpful when comparing fractions? How can fractions be represented as the sum of unit fractions? What does it mean to add and subtract fractions and mixed numbers? What is a standard procedure for adding and subtracting fractions and mixed numbers with like denominators? How can fractions and mixed numbers be added and subtracted using visual models? How can visual models be used to help with multiplying a whole number by a fraction? How can understanding multiplication be helpful in multiplying fractions by whole numbers?

whole number parts. Sometimes whole numbers or fractions need to be renamed. Positive fractions can be added or subtracted by locating a fraction on the number line and then moving right to add or left to subtract. Fractional amounts greater than 1 can be represented using a whole number and a fraction. Whole numbers can be represented as fractions. When the numerator and denominator are equal, the fraction equals 1. A fractional amount can be decomposed into a sum of fractions in more than one way Physical representations and symbols can be used to develop the understanding that a/b = a x 1/b. To multiply a fraction by a whole number, one must multiply the whole number by the numerator of the fraction and then divide the product by the denominator of the fraction. Understand decimal notation for fractions and compare decimal fractions. Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value. A decimal is another name for a fraction. Decimal numeration is just an extension of whole number numeration. Place value can be used to compare and order decimals. Relationships among dollars, dimes and pennies are a good model for decimal numeration.	

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

Students are learning to/that…

- Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models.
- Compare two fractions with different numerators and different denominators by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions by using a visual fraction mode.
- Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation.
- Add and subtract mixed numbers with like denominators.
- Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.
- Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
- Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).
- Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.
- Solve word problems involving multiplication of a fraction by a whole number by using visual fraction models and equations to represent the problem.
- Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.
- Use decimal notation for fractions with denominators 10 or 100.
- Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions by using a visual model.

SUGGESTED ACTIVITIES

- Learning Centers
- Manipulatives
- Tiered Lessons
- Project based Learning
- Pictorial Representations
- Problems of the Day
- Educational Websites such as, but not limited to:

- Nearpod
- Khan Academy
- ST Math
- IXL

- 4.NF.B.3c Cynthia's Perfect Punch
- 4.NF.B.3c Peaches
- 4.MD.B.4 Button Diameters
- 4.NF.B.4 Extending Multiplication From Whole Numbers to Fractions
- 4.NF.B.4c Sugar in six cans of soda
- 4.NF.C.5 Adding Tenths and Hundredths
- 4.NF.C.6 Dimes and Pennies
- 4.NF.C.6 Expanded Fractions and Decimals
- 4.NF.C.7 Using Place Value
- 4.MD.A.2 Margie Buys Apples

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checklists Peer Assessment Vocabulary Quizzes Rubrics Participation and teacher observation Mini Whiteboard Responses Think-Pair-Share Concept Map Classroom Poll	Unit Tests End-of-Book Test NJSLA Test
Benchmark Assessment: Star 360 Benchmark Unit Benchmarks	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:	**Teacher Created Materials:**	**Supplemental Resources:**
EnVision	Nearpod Presentations	• Nearpod • IXL • ST Math • Khan Academy • Kahoot • Choice Boards

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
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 4

Geometry and Measurement

UNIT SUMMARY

In Unit 4, students build, draw, and investigate two-dimensional shapes to increase their knowledge of properties of two-dimensional objects and the use of them to solve problems involving symmetry. They recognize key parts of figures such as parallel lines, perpendicular lines, points, line segments, and right angles. Students identify angles as geometric shapes formed by two rays, understand concepts of angle measurement, and measure angles using protractors. Students draw angles and apply the knowledge that angle measure is additive to create and solve equations to find unknown angle measures.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

Module A:

4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Module B:
4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one degree angle,” and can be used to measure angles.
b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of

the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student learning Standards- English Language Arts:

RI.4.1. Refer to details and examples in a text and make relevant connections when explaining the text says explicitly and when drawing inferences from the text.

RI.4.2. Determine the main idea of a text and explain how it is supported by key details; marize the text.

RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical ncluding what happened and why, based on specific information in the text.

RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, ams, time lines, animations, or interactive elements on Web pages) and explain how the nation contributes to an understanding of the text in which it appears.

New Jersey Student Learning Standards- Science 2020:

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of ering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-1 Analyze and interpret data from maps to describe patterns of Earth's features.

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4-ESS2-1 Analyze and interpret data from maps to describe patterns of Earth's features.

New Jersey Student Learning Standards -Social Studies 2020:

6.1.4.B.1 Compare and contrast information that can be found on different types of maps and mine how the information may be useful.

6.1.4.B.2 Use physical and political maps to explain how the location and spatial relationship ces in New Jersey, the United States, and other areas, worldwide, have contributed to cultural on and economic interdependence.

6.1.4.B.3 Explain how and when it is important to use digital geographic tools, political maps, lobes to measure distances and to determine time zones and locations using latitude and ude

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 perspectives to d 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

2020 New Jersey Student Learning Standards – Computer Science and Design Thinking
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.
8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

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	**9.2: Career Awareness, Exploration & Preparation, and Training**	**9.3: Career and Technical Education**
BB. Civic Responsibility CC. Financial Institutions DD. Financial Psychology EE. Planning and Budgeting FF. Risk Management and Insurance GG. Civic Financial Responsibility HH. Credit Profile II. Economic and Government Influences JJ. Credit and Debt Management	S. Career Awareness (K-2) **T. Career Awareness and Planning (3-5)** U. Career Awareness and Planning (6-8) V. Career Awareness and Planning (9-12) **9.4 Life Literacies and Key Skills** A. Creativity and Innovation **B Critical Thinking and Problem-solving** C. Digital Citizenship D. Global and Cultural Awareness W. Information and Media Literacy **X. Technology Literacy**	WW. Agriculture XX. Architecture YY. Arts,A/V, Technology ZZ. Business Management **AAA. Education** BBB. Finance CCC. Government DDD. Health Science EEE. Hospital & Tourism FFF. Human Services GGG. Information Tech. HHH. Law and Public Safety III. Manufacturing JJJ. Marketing **KKK. Science, Technology, Engineering & Math** LLL. Trans./Logistics

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	**ESSENTIAL QUESTIONS**
Line segments and rays are sets of points that describe parts of lines, shapes and solids. Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by size. The measure of an angle depends upon the fraction of the circle cut off by its rays.	How can lines, angles and shapes be described, analyzed and classified? How are angles measured, added and subtracted? How can lines of symmetry be recognized and drawn in two dimensional figures?

The unit for measuring the size of the opening of an angle is 1 degree. Angle measure can be added or subtracted. Two-dimensional or plane shapes have many properties that make them different from one another. Polygons can be described and classified by their sides and angles. Some shapes can be reflected across one or more lines passing through the shape so the shape folds into itself. This is called the line of symmetry.	

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

Students are learning to/that…

• Know that an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle" and can be used to measure angles.

• Know that an angle that turns through n one degree angles has an angle measure of n degrees.

• Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

• Draw points, lines, line segments, rays, angles (i.e. right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

• Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

• Recognize a line of symmetry for a two dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts.

• Identify line-symmetric figures and draw lines of symmetry.

SUGGESTED ACTIVITIES

- Learning Centers

- Manipulatives
- Tiered Lessons
- Project based Learning
- Pictorial Representations
- Problems of the Day
- Educational Websites such as, but not limited to:
    - Nearpod
    - Khan Academy
    - ST Math
    - IXL

- 4.G.A.1 The Geometry of Letters
- 4.G.A.1 What's the Point?
- 4.G.A.2 Are these right?
- 4.G.A.2 Defining Attributes of Rectangles and Parallelograms
- 4.G.A.3 Finding Lines of Symmetry
- 4.G.A.3 Lines of symmetry for triangles
- 4.MD.C.6, 4.MD.C.7, 4.G.A.1 Measuring Angles
- 4.MD.C.7, 4.G.A.2 Finding an unknown angle
- 4.OA.A.3 Carnival Tickets

EVIDENCE OF LEARNING

Formative Assessments:	**Summative Assessment:**
Classroom Discussion Exit Slip Checklists Peer Assessment Vocabulary Quizzes Rubrics Participation and teacher observation Mini Whiteboard Responses Think-Pair-Share Concept Map Classroom Poll	Unit Tests End-of-Book Test NJSLA Test
Benchmark Assessment: Star 360 Benchmark Unit Benchmarks	**Alternative Assessments:** Project Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:	**Teacher Created materials:**	**Supplemental Resources:**
EnVision	Nearpod Presentations	• Nearpod • IXL • ST Math

		• Khan Academy • Kahoot • Choice Boards

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
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