



Grade 5

Math Curriculum

Oradell Public School District
Oradell, NJ

2023

The Grade 5 Math Curriculum was developed by the Oradell Math Curriculum Team and aligned with the New Jersey Student Learning Standards (NJSLS).

Oradell Public School District

Grade 5 Math Curriculum Committee Credits:

Jamie Caruana
Scott Duthie
Hellen Kapp
Amy Kennedy
Jennifer Powers

Megan Bozios, Superintendent
Michelle Hawley, Principal
Amy Brancato, Director of Curriculum and Instruction

Board Policy

This revision is aligned with the New Jersey Student Learning Standards for Mathematics, the New Jersey Student Learning Standards for Computer Science and Design Thinking, the New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills, and the inclusion of connections to Social-Emotional Learning Competencies.

Affirmative Action

During the development of this course of study, particular attention was paid to the elimination or exclusion of any materials which might discriminate on the basis of race, color, national origin, ancestry, age, sex, affectional or sexual orientation, gender identity or expression, marital status, familial status, genetic information, mental or physical disabilities, or in educational opportunities.

Every effort has been made to uphold both the letter and spirit of Affirmative Action mandates as applied to the content, the texts and the instruction inherent in this course.

Introduction to Teaching Mathematics

For more than a decade, research studies of mathematics education in high-performing countries have concluded that mathematics education in the United States must become substantially more focused and coherent in order to improve mathematics achievement in this country. To deliver on this promise, the New Jersey Student Learning Standards (NJSLS) in Mathematics were designed to address the problem of a curriculum that is “a mile wide and an inch deep.”

The new standards build on the best of high-quality math standards from states across the country. They also draw on the most important international models for mathematical practice, as well as research and input from numerous sources, including state departments of education, scholars, assessment developers, professional organizations, educators, parents and students, and members of the public.

The math standards provide clarity and specificity rather than broad general statements. They follow a design that not only stresses conceptual understanding of key ideas but also the organizing principles such as place value and the laws of arithmetic to structure those ideas.

In addition, the sequence of topics and performances outlined in the body of math standards respects what is known about how students learn, namely, that developing sequenced obstacles and challenges for students, absent from the insights about meaning that derive from careful study, is unwise. Therefore, the development of the standards began with research-based learning progressions detailing what is known today about how students’ mathematical knowledge, skill, and understanding develop over time. The knowledge and skills students need to be prepared for mathematics in college, career, and life are woven throughout the mathematics standards.

These standards define what students should understand and be able to do in their study of mathematics. Additionally, this curriculum is written around the Standards for Mathematical Practice. These standards describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem-solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).

Teachers are required to assess understanding by asking the student to justify, in a way that is appropriate to the student’s mathematical maturity, why a particular mathematical statement is true or where a mathematical rule comes from. Mathematical understanding and procedural skill are equally important, and both are assessed by using mathematical tasks of sufficient richness. The assessments contained in this curriculum document reflect the level of rigor represented in the state-level assessments and the NJ state

Model Curriculum for Math. They serve as guideposts for teachers in determining the level of preparedness students need to reach. This curriculum document will continue to evolve as teachers plan their lessons and gather more resources to teach the units.

All About the Mathematics Curriculum

How was the curriculum developed?

The Oradell Public School District's curriculum consists of units that have been inspired by the New Jersey Student Learning Standards - Mathematics. The main professional resource teachers use is *Go Math!* by *Houghton Mifflin Harcourt Publishing Company*. Teachers are encouraged to collaborate to create additional lessons and formative assessments for the whole group, small-group, and individual conferences.

Each unit contains enduring understandings and essential questions with corresponding teaching points. Enduring understandings are statements summarizing important ideas and core processes that are central to math and have lasting value beyond the classroom. They synthesize what students should understand—not just know or do—as a result of studying a particular unit. Moreover, they articulate what students should “revisit” over the course of their lifetimes in relationship to the content area. Essential questions are broad questions with many answers. They encourage transfer beyond the specific skill or topic students are studying and should recur over many years to promote curriculum coherence and real-world connections. In math, a teaching point addresses both the skill and strategy that will be practiced in a given math class. The teaching points in the math curriculum are meant to build student skills over the unit and are chosen based on the assessment of combined skills.

Modifications

The modifications section at the end of each bend is meant to help guide the differentiation of the units for students with IEPs, English Language Learners, Tier 2 At-Risk students (students in Basic Skills) and Gifted and Talented students. Carol Ann Tomlinson defines differentiation as tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction. At its most basic level, differentiation consists of the efforts of teachers to respond to variance among learners in the classroom. Whenever a teacher reaches out to an individual or small group to vary his or her teaching in order to create the best learning experience possible, that teacher is differentiating instruction (Tomlinson, 2000).

Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

1. Content: what the student needs to learn or how the student will get access to the Information
2. Process: activities in which the student engages in order to make sense of or master the content
3. Products: culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit
4. Learning environment: the way the classroom works and feels

Our Math Philosophy

Born on: July 2017

Revised: July 2022

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We believe in a Guided Math approach to the teaching of math. We develop mathematicians to become thinkers and to develop strategies to become global citizens. We believe that students need access to real-world problems and experiences. We believe that students need time, choice, and feedback to be successful. Partnered with explicit instruction in mathematics content, a strategy-based curriculum promotes math behaviors and skills that contribute to strategic thinking, accurate problem solving and extending mathematical learning to new situations.

What is the Guided Math Framework?

To help teachers build capacity by expanding their repertoire of instructional strategies, many education leaders may consider the implementation of Guided Math (Sammons, 2010 and 2013).

This framework offers a wide selection of instructional strategies from which teachers can choose - all of which engage students in challenging mathematical instruction. The flexibility of the framework permits teachers to adapt it to align with their own teaching styles and to meet the needs of their students. When implemented, Guided Math instruction may vary from week to week and from classroom to classroom (Sammons, 2013).

The components of a Guided Math approach are as follows:

- Math Warm-Ups
- Whole-Class Instruction
- Small-Group Instruction
- Math Workshop
- Math Conferences
- Assessment

Components Guided Math Workshop

Math Warm-Ups

While setting a mathematical tone for the day, Math Warm-Ups at the beginning of a day or a class period also provide valuable ongoing mathematical practice for students. Calendar board activities and Math Stretches may serve as brief warm-ups for students. Warm-ups also provide opportunities for students to learn about current event connections to mathematics and to assume classroom responsibilities that reinforce mathematical skills.

Whole-Class Instruction

This more traditional instructional mode is an option for teachers to deliver mini lessons, conduct math-related read-alouds, and model mathematical thinking. They are also valuable for Math Huddle discussions as follow-ups to Math Stretch tasks. Additionally, this format can be used for review, class mathematical games, and activating strategies. Working together in these ways is important in establishing a sense of mathematical community.

Small-Group Instruction

At the heart of the framework is small-group instruction with groups in which the composition is fluid and based upon previously identified, specific instructional needs. These small-group lessons allow teachers to

more easily differentiate instruction and to help students develop proficiency in the mathematical practices as described by the New Jersey State Learning Standards for Mathematics.

In addition, the intimate nature of small-group lessons enables teachers to maximize student engagement (both hands-on and minds-on), to conduct ongoing informal formative assessment, and to closely monitor understanding as students work. Because teachers are able to respond immediately when misconceptions are observed or move forward with greater challenges when understanding is evident, instruction is more efficient than traditional whole-class lessons. In spite of the fact that these lessons are usually much shorter in duration, greater student understanding of concepts and skills are achieved.

Math Workshop

During Math Workshop, students work independently on math workstation tasks that provide practice of previously mastered concepts and skills, promote computational fluency, or challenge students to engage in mathematical investigations. Playing math games is a common component of Math Workshop, but not the only option. Paper and pencil tasks may be included, as well as tasks that require documenting mathematical thinking in math journals. Students learn to assume responsibility for working independently during Math Workshop. This allows teachers to teach small-group lessons and conduct conferences with individual students.

Math Conferences

These one-on-one conversations between a teacher and a student are important assessment and teaching tools. Students explain their mathematical thinking related to the work at hand while teachers ask clarifying questions, assess student understanding, and determine the students' next steps in learning. Specific, targeted and brief teaching points are delivered during these conversations. Students practice mathematical communication skills as they are encouraged to self-assess their progress toward their own mathematical learning goals.

Assessment

Essential to the Guided Math framework is balanced and timely assessment, especially formative assessment. Knowing students' learning needs allows teachers to plan lessons so that students receive "just right" instruction. That may require instruction that fills gaps in knowledge and skills for some students or provides additional challenges for others. Only by knowing specific needs when learning is occurring can teachers maximize their effectiveness.

Suggested Pacing Guide for Math Grade 5

Unit	Approximate Months	Unit	Skills
1	2 Sept- Oct	<u>Place Value, Numerical Expressions, Multiplication and Division of Whole Numbers</u>	Base 10, Numerical Expressions, Division with 1 and 2 digit divisors
2	2.5 Nov- Mid-Jan	<u>Decimals</u>	Addition, Subtraction, Multiplication, Division
3	2.5 Mid-Jan- Mar	<u>Fractions</u>	Addition, Subtraction, Multiplication, Division
4	2.5 Apr- Mid-Jun	<u>Algebra, Measurement, Geometry and Volume</u>	Patterns and graphing, converting units of measurement, geometry and volume of rectangular prisms
5	.5 Mid-June- End of Year	<u>Real World Application of Math</u>	Use 5th grade skills to solve real world problems

5th Grade Math Curriculum

Unit 1: Place Value, Expressions, Multiplication and Division of Whole Numbers Go Math! Chapters 1 & 2

Unit Overview:

In this unit, as students mature mathematically, they encounter more challenging problems. They observe that in real life, they solve problems, not just perform computations. It is important to understand mathematics, as well as how to translate numbers and symbols into expressions before solving. Being fluent in the terms associated with the operations allows students to translate with more ease. It is helpful to ask students to describe the information given and what they know in their own words. Expecting students to justify the computations they used further supports developing their understanding of the operations and how to solve problems.

It is important for students to have a good understanding of the relationship between multiplication and division. Elaborating expressions will help students to understand and visualize the relationships presented. The order of operations is a convention established to clarify the meaning of mathematical expressions. If students have already made the connections between addition and subtraction and multiplication and division as inverse operations, they can think of the order as “multiplications before additions.” Students must understand that parentheses are used for emphasis or clarification. They look for and make use of structure when they find patterns that connect the operations.

Modeling division with base-ten blocks reinforces place value as well as the sharing concept of division. This leads to understanding the algorithm by illustrating the process of regrouping, estimation, and subtraction. Understanding different meanings of division helps students make sense of problems and persevere in solving them. Such understanding gives students strategies to make sense of situations. This, in turn, helps students persevere in finding solutions.

Enduring Understandings

- Understand the place value system.
- Perform operations with multi-digit whole numbers and decimals to the hundredths.
- Write and interpret numerical expressions.
- Perform operations with multi-digit whole numbers and decimals to the hundredths

Essential Questions

- How can you use place value patterns to compare base-ten numbers?
- How can you use multiplication and division in a real life situation?
- How does using base-ten blocks to model and understand division of whole numbers help you explain real world problems?
- Why is estimation a life skill?

Assessments

Possible Formative Assessments
<ul style="list-style-type: none">• Teacher Observation• Student Participation• One-to-One Conferencing• Small Strategy Groups• LinkIt! Progress Reports• DreamBox Progress Reports
Summative Assessments
<ul style="list-style-type: none">• Chapter Quizzes & Tests<ul style="list-style-type: none">◦ Ch. 1 & 2 Go Math!• Student Self-Reflection by Chapter• Chapter Performance Tasks (as appropriate)• Online Math Activity Scores
Benchmark Assessments
<ul style="list-style-type: none">• LinkIt! Form A
Alternative Assessments
<ul style="list-style-type: none">• Modified Unit Assessment

Standards (NJSL) Addressed in this Unit

Number and Operations in Base Ten 5.NBT
<p>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.</p> <p>5.NBT.A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</p> <p>5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.</p> <p>5.NBT.B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p>
Operations and Algebraic Thinking 5.OA
<p>5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</p> <p>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.</p>

Numbers and Operations- Fractions 5.NF

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?

Computer Science and Design Thinking

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.

Career Readiness, Life Literacies, and Key Skills

LIFE LITERACIES AND KEY SKILLS

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

PRACTICES

- **CLKSP4** Demonstrate creativity and innovation.
- **CLKSP5** Utilize critical thinking to make sense of problems and persevere in solving them.
- **CLKSP8** Use technology to enhance productivity, increase collaboration, and communicate effectively.

Interdisciplinary Connections:

English Language Arts

Writing

- **W.5.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.5.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Reading

- **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.
- **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- **RI.5.8.** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

Speaking & Listening

- **SL.5.3.** Summarize the points a speaker makes and explain how each claim is supported by

reasons and evidence

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Science

- **PS3-1** Use models to describe that energy in animals' food (used for body repair, growth, and motion and to maintain body warmth) was once energy from the sun.

Standards for Mathematical Practice

MP1 - Make sense of problems and persevere in solving them.

MP2 - Reason abstractly and quantitatively.

MP3 - Construct viable arguments and critique the reasoning of others.

MP4 - Model with mathematics.

MP5 - Use appropriate tools strategically.

MP6 - Attend to precision.

MP7 - Look for and make use of structure.

MP8 - Look for and express regularity in repeated reasoning.

Unit 1 Place Value, Numerical Expressions, Multiplication and Division of Whole Numbers

Suggested Teaching Points

Place Value

Students will...

- Recognize the 10 to 1 relationship among place-value positions.
- Read and write whole numbers through hundred millions.
- Write an explanation for how an exponent shows the powers of 10.
- Solve problems by using the strategy “*solve a simpler*”.

Numerical Expressions

Students will...

- Write numerical expressions.
- Use the order of operations to evaluate numerical expressions.
- Evaluate numerical expressions with parentheses, brackets, and braces.

Multiplication of Whole Numbers

Students will...

- Use properties of operations to solve problems.
- Create a set of instructions on how to use basic facts and patterns to multiply by a 2-digit number.
- Write and evaluate repeated factors in exponent form.
- Use basic facts and patterns to multiply mentally by multiples of 10, 100, and 1,000.
- Multiply by 1-digit numbers.
- Multiply by multi-digit numbers.

- Use multiplication to solve division problems.

Division of Whole Numbers

Students will

- Illustrate and describe the relationship between two place-value positions.
- Place the first digit in the quotient by estimating or using place value.
- Divide 3 and 4-digit dividends by 1-digit divisors.
- Model division with 2-digit divisors by using base-ten blocks.
- Use partial quotients to divide by 2-digit divisors.
- Estimate quotients by using compatible numbers.
- Divide by 2-digit divisors.
- Solve division problems and decide when to write a remainder as a fraction.
- Adjust the quotient if the estimate is too high or too low.
- Solve problems by using the strategy to draw a *diagram*.

Unit Specific Vocabulary

Base	Compatible Numbers
Distributive Property	Dividend
Evaluate	Divisor
Exponent	Factor
Inverse Operations	Partial Quotient
Numerical Expression	Product
Order of Operations	Quotient
Period	Remainder

Suggested Modifications and Accommodations

These strategies can be adapted to scaffold for students needing more support or extend the learning for higher level students. Differentiation is accomplished through content, process, product, and learning environment.

Instructional Materials and Learning Activities

Core Instructional Materials:

- *Go Math 5* © 2015 - Houghton Mifflin Harcourt
 - Teacher Edition, Student Workbooks, Unit Assessments, Student Reference Book, Activity Cards, Blackline Masters

Supplemental Materials:

- Bridges in Mathematics for intervention
- Digital Resources:
 - *Think Central*® Digital (<https://www-k6.thinkcentral.com>)
 - ebooks, eToolkit, eTeacher's Manual, eStudent Books, online resources
 - Online Practice Assignments (Includes but not limited to: IXL, Xtra Math)
 - [Grade 5 - eGlossary](#)
 - Bridges in Mathematics (<https://bridges.mathlearningcenter.org/>) for intervention
 - DreamBox

Special Education Students

- Use various methods to understand a student's learning style, i.e.- observation, surveys, conferring.
- Ask students to recall what they have already learned in ways that activate prior knowledge and build on that knowledge.
- Model problem-solving processes.
- Model productive and engaging partner talk.
- Provide direct instruction and/or think aloud for clarity.
- Build and/or use anchor charts with students and continually refer to them while teaching.
- Provide opportunities for students to turn and talk.
- Use modeling and manipulatives.
- Provide graphic organizers for making inferences when possible.
- Use step-by-step how-to sheets to guide student problem-solving.
- Refer to student IEP goals and modifications.
- Use pre-assessment data to drive instruction.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Use a problem [solving plan](#) to organize mathematical thinking.
- Incorporate [place value charts](#) into small group lessons.
- To prepare for using traditional multiplication to multiply larger numbers, multiply numbers in an increasing series. First have students solve 261×3 (783). Then, have students solve $3,261 \times 3$ (9,783). Discuss how the problems are similar and different. Finally, have students solve $23,261 \times 3$ (69,783) and discuss.

Students at Risk

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- [Skills Review Handbook](#)
- Shorten assignments.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Go Math! Grab-and-Go! Differentiated Centers Kit.
- [Brainpop - Multiplication](#)
- [Brainpop - Exponents](#)
- [Brainpop - Order of Operations](#)
- [Brainpop - Division](#)
- [Khan Academy - Find Number's Place Value](#)
- [Khan Academy - Comparing Place Values](#)
- [Illustrative Mathematics- Seeing is Believing](#)
- To prepare for using traditional multiplication to multiply larger numbers, multiply numbers in an increasing series. First have students solve 261×3 (783). Then, have students solve $3,261 \times 3$ (9,783). Discuss how the problems are similar and different. Finally, have students solve $23,261 \times 3$ (69,783) and discuss.

English Language Learners

- [Glossary of Terms](#) from Big Ideas
- Allow use of a bilingual dictionary.
- Allow use of handheld translator.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.

Gifted and Talented

- Provide opportunities to lead discussion.
- Use flexible grouping.
- Make a poster comparing different multiplication strategies. Discuss with a partner why different strategies might be more efficient for different problems.
- Use projects, such as the following:
 - [Super Bowl ads and scientific notation](#)
 - [Who had the Best NBA Season?](#)
 - [Olympic Rankings](#)
 - [How many wings did the Bills send the Bengals?](#)
 - [Chili Con Queso!](#)
 - [Going Bananas!](#)
 - [Elmer's Multiplication Error \(Illustrative Mathematics\)](#)

- [Minutes and Days \(Illustrative Mathematics\)](#)
- [Millions and Billions of People \(Illustrative Mathematics\)](#)
- [Watch Out for Parentheses \(Illustrative Mathematics\)](#)
- [Bowling for Numbers \(Illustrative Mathematics\)](#)
- [Using Operations and Parentheses \(Illustrative Mathematics\)](#)
- [Comparing Products \(Illustrative Mathematics\)](#)
- [Video Game Scores \(Illustrative Mathematics\)](#)

Students with 504 Plans

- To prepare for using traditional multiplication to multiply larger numbers, multiply numbers in an increasing series. First have students solve 261×3 (783). Then, have students solve $3,261 \times 3$ (9,783). Discuss how the problems are similar and different. Finally, have students solve $23,261 \times 3$ (69,783) and discuss.
- *Readiness* activities
- *Extra Practice* activities
- Use of manipulatives, counters, number grid, and vocabulary picture cards
- Preferential Seating
- Monitor On-Task Performance
- Establish and maintain eye contact when giving oral directions
- Directions repeated and/or clarified
- Provide copy of class notes
- Homework does not impact grade in class
- Reduce homework amount
- Modify assessments

Social-Emotional Learning Competencies

- **Self-Awareness:** ability to recognize one's emotions and know one's strengths and limitations
 - Connections:
 - Reflecting on one's learning (Oral, Thumbs Up, Thumbs Down, Pictures, etc.)
- **Self-Management:** ability to regulate and control one's emotions and behaviors, particularly in stressful situations
 - Connections:
 - Visit the mindfulness/cool down corner in the classroom for self-soothing activities (Squishy ball, sand timer, fidget popper, etc.)
- **Social Awareness:** ability to take the perspective of others, demonstrate empathy, acknowledge and appreciate similarities and differences, and understand how one's actions influence and are influenced by others
 - Connections:
 - Students collaborate and help each other during math centers

- **Relationship Skills:** refers to one’s ability to demonstrate prosocial skills and behaviors in order to develop meaningful relationships and resolve interpersonal conflicts
 - Connections:
 - Class discussions
 - Incentives for individual students and small groups

- **Responsible Decision-Making:** refers to the ability to use multiple pieces of information to make ethical and responsible decisions
 - Connections:
 - Class rules and routines
 - Class discussions
 - Following directions for math centers

5th Grade Math Curriculum

Unit 2: Decimals

Go Math! Chapters 3, 4, & 5

Unit Overview:

Modeling decimal addition and subtraction with base-ten blocks provides a method that helps students avoid a common error, operating with decimals as though they are whole numbers, often ignoring the significance of a decimal point. Using models that represent the process of adding decimals helps students focus on place value. Base-ten blocks can help students make sense of regrouping in subtraction of decimals. To help students develop their conceptual understanding, have them use models to explore subtraction with decimals (Heddens & Speer, 2006).

Students add and subtract decimals using several models. Of particular importance is the place-value model represented with base-ten blocks. As students solve addition problems with base-ten blocks, where the flat is equal to one, the long is equal to one-tenth and the small cube is equal to one-hundredth, they are led to see that when adding decimals, the hundredths can be combined with hundredths, tenths with tenths, and so on. They see that similar reasoning can be applied to subtraction. These experiences help students to look for and make use of structure as they make sense of place-value algorithms for adding and subtracting decimals.

An area model is an effective strategy to teach decimal multiplication. There are advantages of estimating the value of decimal computations both before and after carrying out paper-and-pencil computations or calculations on a calculator (Van de Walle, 2004). Estimation focuses students' thinking on the meaning of the numbers and operations, not on counting decimal places. Many students who focus on the paper-and-pencil rules for decimal computations do not think about the actual values of the numbers. Understanding of the value of numbers can be developed by first having students multiply two whole numbers. Then, using the same numbers, place a decimal point in one of the factors, finally placing decimal points in both factors and comparing the products. Reasonable estimates can often be made by rounding decimals to whole numbers.

Modeling operations helps students make sense of the procedures. Dividing decimals by whole numbers is best modeled using sharing (partitive) division. This is where the total number (dividend) is shared among the given number of groups (divisor). Students use decimal models to represent the dividend and then share them equally among the given number of groups, regrouping as necessary.

Students make sense of procedures for dividing decimals by estimating the quotient using compatible numbers. This estimate can help the student place the decimal point after dividing. Exploring division with models and contexts and making sense of the placement of the decimal point after dividing will help students to understand how the decimal division algorithms work.

Enduring Understandings

- Use the place value system through the thousandths.
- Perform operations with multi-digit whole numbers and decimals to hundredths.

Essential Questions

- Why is place value helpful when adding and subtracting decimals?
- How can you solve multiplication problems involving decimals?
- Why does the decimal point matter when dividing and multiplying decimals?
- When might you estimate decimal quotients and products?

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Assessments

Possible Formative Assessments
<ul style="list-style-type: none">● Teacher Observation● Student Participation● One-to-One Conferring● Small Strategy Groups● LinkIt! Progress Reports● DreamBox Progress Reports
Summative Assessments
<ul style="list-style-type: none">● Chapter Quizzes & Tests<ul style="list-style-type: none">○ Ch.3, 4, & 5 Go Math!● Student Self-Reflection by Chapter● Chapter Performance Tasks (as appropriate)● Online Math Activity Scores
Alternative Assessments
<ul style="list-style-type: none">● Modified Chapter Assessment● Modified Unit Assessment

Standards (NJSLs) Addressed in this Unit

Numbers and Operations in Base Ten 5.NBT
<p>5.NBT.A.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.</p> <p>5.NBT.A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</p> <p>5.NBT.A.3.a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.</p> <p>5.NBT.A.3.b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p> <p>54. Use place value understanding to round decimals to any place.</p> <p>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.</p>
Computer Science and Design Thinking
<p>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.</p> <p>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.</p>
Career Readiness, Life Literacies, and Key Skills
LIFE LITERACIES AND KEY SKILLS

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9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

PRACTICES

- **CLKSP4** Demonstrate creativity and innovation.
- **CLKSP5** Utilize critical thinking to make sense of problems and persevere in solving them.
- **CLKSP8** Use technology to enhance productivity, increase collaboration, and communicate effectively.

Interdisciplinary Connections:

English Language Arts

Writing

- **W.5.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.5.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Reading

- **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.
- **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- **RI.5.8.** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

Speaking & Listening

- **SL.5.3.** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence

Standards for Mathematical Practice

MP1 - Make sense of problems and persevere in solving them.

MP2 - Reason abstractly and quantitatively.

MP3 - Construct viable arguments and critique the reasoning of others.

MP4 - Model with mathematics.

MP5 - Use appropriate tools strategically.

MP6 - Attend to precision.

MP7 - Look for and make use of structure.

MP8 - Look for and express regularity in repeated reasoning.

Unit 2 Decimals

Addition and Subtraction

Students will

- Model, read, and write decimals to the thousandths.

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- Read and write decimals through the thousandths.
- Compare and order decimals to the thousandths by using place value.
- Round decimals to any place value.
- Model decimal addition by using base-ten blocks.
- Model decimal subtraction by using base-ten blocks.
- Make reasonable estimates of decimal sums and differences.
- Add decimals using place value.
- Subtract decimals using place value.
- Identify, describe, and create numeric patterns with decimals.
- Solve problems by using the strategy to make *a table*.
- Choose a method to find a decimal sum or difference.

Multiplication

Students will...

- Find patterns in products when multiplying by powers of 10.
- Model multiplication of whole numbers and decimals.
- Multiply a decimal and a whole number using properties and place value.
- Use expanded form and place value to multiply a decimal and a whole number.
- Draw and explain how the strategy “*draw a diagram*” helps to solve a decimal multiplication problem.
- Demonstrate and explain the way to use a model to multiply decimals.
- Place the decimal point in a decimal multiplication.
- Multiply decimals with zeros in the product.

Division

Students will...

- Find patterns in quotients when dividing by powers of 10.
- Model division of decimals by whole numbers.
- Estimate decimal quotients.
- Divide decimals by whole numbers.
- Model division by decimals.
- Place the decimal point in decimal division.
- Write a zero in the dividend to find a quotient.
- Solve multi-step decimal problems using the strategy “*work backwards.*”

Unit Specific Vocabulary

Benchmark	Pattern
Decimal	Place Value
Decimal Point	Product
Dividend	Round
Divisor	Sequence
Equivalent Fractions	Tenth
Estimate	Term
Exponent	Thousandths

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Suggested Modifications and Accommodations

These strategies can be adapted to scaffold for students needing more support or extend the learning for higher level students. Differentiation is accomplished through content, process, product, and learning environment.

Instructional Materials and Learning Activities*Core Instructional Materials:*

- *Go Math 5* © 2015 - Houghton Mifflin Harcourt
 - Teacher Edition, Student Workbooks, Unit Assessments, Student Reference Book, Activity Cards, Blackline Masters

Supplemental Materials:

- Bridges in Mathematics for intervention
- Digital Resources:
 - *Think Central*® Digital (<https://www-k6.thinkcentral.com>)
 - ebooks, eToolkit, eTeacher's Manual, eStudent Books, online resources
 - Online Practice Assignments (Includes but not limited to: IXL, Xtra Math)
 - [Grade 5 - eGlossary](#)
 - Bridges in Mathematics (<https://bridges.mathlearningcenter.org/>) for intervention
 - DreamBox

Special Education Students

- Use various methods to understand a student's learning style, i.e.- observation, surveys, conferring.
- Ask students to recall what they have already learned in ways that activate prior knowledge and build on that knowledge.
- Model problem-solving processes.
- Model productive and engaging partner talk.
- Provide direct instruction and/or think aloud for clarity.
- Build and/or use anchor charts with students and continually refer to them while teaching.
- Provide opportunities for students to turn and talk.
- Use modeling and manipulatives.
- Provide graphic organizers for making inferences when possible.
- Use step-by-step how-to sheets to guide student problem-solving.
- Refer to student IEP goals and modifications.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Use a problem [solving plan](#) to organize mathematical thinking.
- Incorporate [place value charts](#) into small group lessons.

Students at Risk

- [Skills Review Handbook](#)
- Shorten assignments.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Go Math! Grab-and-Go! Differentiated Centers Kit.
- [Brainpop - Dividing Decimals](#)
- [Brainpop - Multiplication](#)
- [Khan Academy - Decimal Place Value](#)
- [Khan Academy - Example of adding decimals](#)
- [Khan Academy - Subtracting Decimals](#)
- [Khan Academy - Multiplying Decimals](#)
- [Khan Academy - Long division with decimals](#)
- [Khan Academy - Dividing decimals completely](#)
- [Learnzillion- Represent Decimal Values to the Thousandths Using Base-10 Blocks](#)
- [Illustrative Mathematics- Multiplying Decimals by 10](#)
- [Illustrative Mathematics- Drawing Pictures to Illustrate Decimal Comparisons](#)
- [Illustrative Mathematics- Comparing Decimals on a Number Line](#)
- [Illustrative Mathematics- Placing Thousandths on a Number Line](#)

English Language Learners

- [Glossary of terms](#) from Big Ideas.
- Allow use of a bilingual dictionary.
- Allow use of handheld translator.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Set a writing goal for assignment and then focus only on that goal.

Gifted and Talented

- Provide opportunities to lead discussion.
- Use flexible grouping.
- Enrichment activities
- To extend work by comparing decimals, have students calculate and compare baseball player's batting averages. Identify the strongest hitter and explain reasoning.
- Use projects, such as the following:
 - [Shipping Crutch](#)
 - [Is This Promo a Good Deal?](#)
 - [Cheap-Otle?](#)

- [Super Bowl Ads and Scientific Notation](#)
- [The Value of Education \(Illustrative Mathematics\)](#)
- [Kipton's Scale \(Illustrative Mathematics\)](#)
- [Tenths and Hundredths \(Illustrative Mathematics\)](#)
- [Marta's Multiplication Error \(Illustrative Mathematics\)](#)

Students with 504 Plans

- *Readiness* activities
- *Extra Practice* activities
- Preferential Seating
- Monitor On-Task Performance
- Establish and maintain eye contact when giving oral directions
- Directions repeated and/or clarified
- Provide copy of class notes
- Homework does not impact grade in class
- Reduce homework amount
- Modify assessments
- Use a place value chart, base ten blocks, and hundreds grid to give students visual representations of decimals.
- Use of manipulatives, counters, number grid, and vocabulary picture cards

Social-Emotional Learning Competencies

- **Self-Awareness**: ability to recognize one's emotions and know one's strengths and limitations
 - Connections:
 - Reflecting on one's learning (Oral, Thumbs Up, Thumbs Down, Pictures, etc.)
- **Self-Management**: ability to regulate and control one's emotions and behaviors, particularly in stressful situations
 - Connections:
 - Visit the mindfulness/cool down corner in the classroom for self-soothing activities (Squishy ball, sand timer, fidget popper, etc.)
- **Social Awareness**: ability to take the perspective of others, demonstrate empathy, acknowledge and appreciate similarities and differences, and understand how one's actions influence and are influenced by others
 - Connections:
 - Students collaborate and help each other during math centers
- **Relationship Skills**: refers to one's ability to demonstrate prosocial skills and behaviors in order to develop meaningful relationships and resolve interpersonal conflicts

- Connections:
 - Class discussions
 - Incentives for individual students and small groups
- **Responsible Decision-Making:** refers to the ability to use multiple pieces of information to make ethical and responsible decisions
 - Connections:
 - Class rules and routines
 - Class discussions
 - Following directions for math centers

5th Grade Math Curriculum

Unit 3: Fractions

Go Math! Chapters 6, 7, & 8

Unit Overview:

In this unit, when students have difficulty adding and subtracting fractions with unlike denominators, working with models and examples from the real world is helpful (Kamii & Warrington, 1999). Estimation connects students' understanding of fractions with fraction operations and can prevent common errors. As students make sense of adding and subtracting fractions, they reason abstractly and quantitatively. Students begin exploring fraction operations by representing problem situations with models and drawings to represent the contexts provided. Eventually students decontextualize the situation by operating on the symbols referred to in the problems without using models or drawings. When students transition from concrete to abstract ways of adding and subtracting fractions they are reasoning abstractly and quantitatively. Students are able to contextualize problems presented abstractly during the solution process by drawing pictures, using manipulatives, or thinking about real-world contexts to support the computation as needed to help make sense of the process.

Students base their understanding of fraction multiplication on their understanding of whole number multiplication. Remind students of the “groups of objects” meaning of multiplication using whole numbers m and n . For this, $m \times n$ tells how many equal-size groups (m) there are of objects (n). Extend this to when m and n are fractions. Early use of models, such as rectangular regions, help students to transition to the standard algorithm for multiplying fractions by multiplying the numerators and denominators of the factors. Once students begin using the algorithms in place of models to solve problems involving multiplication of fractions and mixed numbers, they need to be especially careful to check the reasonableness of their results. It is helpful for students to know if the product of two factors will be less than, equal to, or greater than each of its factors when determining if their answers are reasonable.

“Traditionally, in the United States, division of fractions has been taught often by emphasizing the algorithmic procedure ‘invert and multiply’ with little effort to provide students with an understanding of why it works” (Flores, 2002, p. 237). It is useful to connect fraction division to whole number division. Consider two interpretations for $12 \div 3$. If 12 things are shared among the 3 groups, how many will be in each group? How many groups of 3 are in 12? Now consider $2 \div 1/3$. The sharing meaning would not make sense because 2 things cannot be shared among $1/3$ of a group, but the second meaning makes sense. It can be determined how many groups of $1/3$ of the whole are in 2 wholes. Since there are 3 thirds in each whole and you have 2 wholes, there are 6 thirds all together. The expression $1/3 \cdot 3 \div 2$ can be interpreted with sharing by determining how much will be in each group if $1/3$ of a whole is shared equally between the 2 groups. There would be $1/6$ of a whole in each group. When students learn about dividing fractions by whole numbers and dividing whole numbers by fractions, they look for and make use of structure. They do this when they develop connections between whole-number division and fraction division, as well as between division expressions and related multiplication expressions. This builds a foundation for developing the fraction division algorithm.

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Enduring Understandings

- Use equivalent fractions as a strategy to add and subtract fractions.
- Add and subtract fractions with unlike denominators.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
- Multiply fractions and mixed numbers.
- Divide unit fractions by whole numbers and whole numbers by unit fractions.

Essential Questions

- How can you use models to add and subtract fractions that have different denominators?
- How are fractions related to division?
- How can you use a model to multiply fractions?

Assessments

Possible Formative Assessments
<ul style="list-style-type: none">• Teacher Observation• Student Participation• One-to-One Conferencing• Small Strategy Groups• LinkIt! Progress Reports• DreamBox Progress Reports
Summative Assessments
<ul style="list-style-type: none">• Chapter Quizzes & Tests<ul style="list-style-type: none">◦ Ch. 6, 7, & 8 Go Math!• Student Self-Reflection by Chapter• Chapter Performance Tasks (as appropriate)• Online Math Activity Scores
Benchmark Assessments
<ul style="list-style-type: none">• LinkIt! Form B
Alternative Assessments
<ul style="list-style-type: none">• Modified Unit Assessment• Modified Chapter Assessment

Standards (NJSLs) Addressed in this Unit

Numbers and Operations: Fractions 5.NF

5.NF.A.1. 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, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.)

5.NF.A.2. 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.B. 3. 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?

5.NF.B.4.a. Interpret the product $(a/b) \times q$ as 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, $(a/b) \times (c/d) = ac/bd$.)

5.NF.B.4b 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.B.5a. 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.

5.NF.B.5b. 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.B.6 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.B.7a. 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 $(1/12) \times 4 = 1/3$.

5.NF.B.7b. 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 $20 \times (1/5) = 4$.

5.NF.B.7c. 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?

Computer Science and Design Thinking

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.

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LIFE LITERACIES AND KEY SKILLS

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Speaking & Listening

- **SL.5.3.** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence

Standards for Mathematical Practice

MP1 - Make sense of problems and persevere in solving them.

MP2 - Reason abstractly and quantitatively.

MP3 - Construct viable arguments and critique the reasoning of others.

MP4 - Model with mathematics.

MP5 - Use appropriate tools strategically.

MP6 - Attend to precision.

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Unit 3: Fractions

Addition and Subtraction

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Students will...

- Use models to add fractions with unlike denominators.
- Use models to subtract fractions with unlike denominators.
- Make reasonable estimates of fraction sums and differences.
- Find a common denominator or a least common denominator to write equivalent fractions.
- Use equivalent fractions to add and subtract fractions.
- Add and subtract mixed numbers with unlike denominators.
- Rename to find the difference of mixed numbers.
- Identify, describe, and create numeric patterns with fractions.
- Solve backwards using the strategy “*work backward.*”
- Add fractions and mixed numbers with unlike denominators using the properties.

Multiplication**Students will...**

- Model to find the fractional part of a group.
- Model the product of a fraction and a whole number.
- Multiply fractions and whole numbers.
- Multiply fractions using models.
- Relate the size of the product compared to the size of one factor when multiplying fractions.
- Use a model to multiply two mixed numbers and find the area of a rectangle.
- Relate the size of the product to the factors when multiplying fractions greater than one.
- Solve problems using the strategy *guess, check, and revise.*

Division**Students will...**

- Divide a whole number by a fraction and divide a fraction by a whole number using a model.
- Solve problems using the strategy *draw a diagram.*
- Interpret a fraction as division and solve whole number division problems that result in a fraction or a mixed number.
- Divide a whole number by a fraction and divide a fraction by a whole number.
- Represent division by drawing diagrams and writing story problems and equations.

Unit Specific Vocabulary

Benchmark	Equation
Common Denominator	Equivalent Fractions
Common Factor	Factor
Common Multiple	Fraction
Denominator	Inverse Operations
Difference	Mixed Number
Dividend	Numerator
Divisor	Product
Quotient	Simplest Form
Remainder	

Suggested Modifications and Accommodations

These strategies can be adapted to scaffold for students needing more support or extend the learning for higher level students. Differentiation is accomplished through content, process, product, and learning environment.

Instructional Materials and Learning Activities

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 - DreamBox

Special Education Students

- Use various methods to understand a student's learning style, i.e.- observation, surveys, conferring.
- Ask students to recall what they have already learned in ways that activate prior knowledge and build on that knowledge.
- Model problem-solving processes.
- Model productive and engaging partner talk.
- Provide direct instruction and/or think aloud for clarity.
- Build and/or use anchor charts with students and continually refer to them while teaching.
- Provide opportunities for students to turn and talk.
- Use modeling and manipulatives.
- Provide graphic organizers for making inferences when possible.
- Use step-by-step how-to sheets to guide student problem-solving.
- Refer to student IEP goals and modifications.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Use a problem [solving plan](#) to organize mathematical thinking.
- Incorporate [place value charts](#) into small group lessons.

Students at Risk

- [Skills Review Handbook](#)
- Shorten assignments.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- [Brainpop - Fractions](#)
- [Brainpop - Simplifying Fractions](#)
- [Brainpop - Adding and Subtracting Fractions](#)
- [Brainpop - Multiplying and Dividing Fractions](#)
- [Brainpop - Understanding Mixed Numbers](#)
- [Brainpop - Converting Fractions to Decimals](#)
- [Khan Academy - Introduction to Fractions](#)
- [Khan Academy - More about Fractions](#)
- [Khan Academy - Introduction to Equivalent Fractions](#)
- [Khan Academy - Creating Equivalent Fractions](#)
- [Khan Academy - Comparing Fractions](#)
- [Khan Academy - Add Unlike denominators](#)
- [Khan Academy - Introduction to Adding Mixed Numbers](#)
- [Khan Academy - Adding Mixed Numbers with Unlike Denominators](#)
- [Khan Academy - Add Mixed Numbers with Regrouping](#)
- [Khan Academy - Subtract Unlike Denominators](#)

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- [Khan Academy - Introduction to Subtracting Mixed Numbers](#)
- [Khan Academy - Subtracting Mixed Numbers with Unlike Denominators](#)
- [Khan Academy - Subtracting Mixed Numbers with Regrouping](#)
- [Khan Academy - Multiplying Fractions](#)
- [Khan Academy - Divide Unit fraction by a Whole Number](#)
- [Khan Academy - Divide a Whole Number by a Unit Fraction](#)
- [Khan Academy - Divide fraction by a Whole Number Area Model](#)
- [Khan Academy - Divide Whole Number by a Fraction Area Model](#)
- [Khan Academy - Understand a Fraction is a Division Problem](#)
- [Illustrative Mathematics- Mixed Numbers with Uncommon Denominators](#)
- [Illustrative Mathematics- Finding Common Denominators to Add](#)
- [Illustrative Mathematics- Finding Common Denominators to Subtract](#)

English Language Learners

- [Glossary of Terms](#)
- Allow use of a bilingual dictionary.
- Allow use of handheld translator.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Set a writing goal for assignment and then focus only on that goal.

Gifted and Talented

- Provide opportunities to lead discussion.
- Use flexible grouping.
- Use projects, such as the following:
 - [Iditarod - Is it the last great race on Earth?](#)
 - [World Cup Rankings](#)
 - [Chicken Sharing](#)
 - [How Can Nike Give Away So Much Stuff?](#)
 - [Shipping Crunch](#)
 - [Egyptian Fractions \(Illustrative Mathematics\)](#)
 - [Jog-a-Thon \(Illustrative Mathematics\)](#)
 - [Making S'mores \(Illustrative Mathematics\)](#)
 - [Do These Add Up? \(Illustrative Mathematics\)](#)
 - [Salad Dressing \(Illustrative Mathematics\)](#)
 - [Sharing Lunches \(Illustrative Mathematics\)](#)
 - [To Multiply, or Not to Multiply \(Illustrative Mathematics\)](#)
 - [Measuring Cups \(Illustrative Mathematics\)](#)
 - [What is 23 Divided by 5? \(Illustrative Mathematics\)](#)
 - [Chavone's Bathroom Tiles \(Illustrative Mathematics\)](#)
 - [Cornbread Fundraiser \(Illustrative Mathematics\)](#)
 - [Mrs. Gray's Homework Assignment \(Illustrative Mathematics\)](#)
 - [New Park \(Illustrative Mathematics\)](#)

- [Grass Seedlings \(Illustrative Mathematics\)](#)
- [Calculator Trouble \(Illustrative Mathematics\)](#)
- [Comparing a Number and a Product \(Illustrative Mathematics\)](#)
- [Comparing Heights of Buildings \(Illustrative Mathematics\)](#)
- [Scaling Up and Down \(Illustrative Mathematics\)](#)
- [Making Cookies \(Illustrative Mathematics\)](#)
- [Dividing by One-Half \(Illustrative Mathematics\)](#)
- [Origami Stars \(Illustrative Mathematics\)](#)
- [Banana Pudding \(Illustrative Mathematics\)](#)

Students with 504 Plans

- *Readiness* activities
- *Extra Practice* activities
- Preferential Seating
- Monitor On-Task Performance
- Establish and maintain eye contact when giving oral directions
- Directions repeated and/or clarified
- Provide copy of class notes
- Homework does not impact grade in class
- Reduce homework amount
- Modify assessments

Social-Emotional Learning Competencies

- **Self-Awareness:** ability to recognize one's emotions and know one's strengths and limitations
 - Connections:
 - Reflecting on one's learning (Oral, Thumbs Up, Thumbs Down, Pictures, etc.)
- **Self-Management:** ability to regulate and control one's emotions and behaviors, particularly in stressful situations
 - Connections:
 - Visit the mindfulness/cool down corner in the classroom for self-soothing activities (Squishy ball, sand timer, fidget popper, etc.)
- **Social Awareness:** ability to take the perspective of others, demonstrate empathy, acknowledge and appreciate similarities and differences, and understand how one's actions influence and are influenced by others
 - Connections:
 - Students collaborate and help each other during math centers
- **Relationship Skills:** refers to one's ability to demonstrate prosocial skills and behaviors in order to develop meaningful relationships and resolve interpersonal conflicts

- Connections:
 - Class discussions
 - Incentives for individual students and small groups
- **Responsible Decision-Making:** refers to the ability to use multiple pieces of information to make ethical and responsible decisions
 - Connections:
 - Class rules and routines
 - Class discussions
 - Following directions for math centers

5th Grade Math Curriculum

Unit 4: Algebra, Measurement, Geometry and Volume

Go Math! Chapters 9, 10, & 11

Unit Overview:

Graphing on a coordinate grid is a useful way to represent data when there are two corresponding data points for each entry, such as in a table. Graphs provide students with a “picture of the data.” Students often see data differently in graphs compared to tables. Students may need support in making sense of the coordinate grid. It is helpful to relate the coordinate grid to two perpendicular number lines that intersect at the zero. A common way to explore change in mathematics is by analyzing data. Algebra provides the tools and processes necessary to study change. For example, consider how we might analyze the amount of rainfall over time. Once the data is collected in a table, students can plot the amount of rainwater collected from one day to the next by recording the days on the x-axis and the amount of rainwater collected on the y-axis. Students can then use the shape of the graph to describe when there was more, less, or no rain. A steep incline in the graph would indicate more rain while a flat graph would indicate no rain. These early explorations will lead students to make sense of more formal explorations in algebra in later grades like determining the slope of a line (NCTM, 2000). Students graph number pairs on a coordinate grid. They analyze patterns and then model those relationships using graphs. These experiences provide meaningful opportunities for students to model with mathematics.

The customary measurement system requires the use of a variety of conversion ratios that are not based on the decimal system. Consequently, students frequently get confused about what operation they should use when making a conversion (Van de Walle, 2004). The following techniques can help students deepen their understanding and lessen their confusion. When making multi-step conversions, encourage students to tackle the problem in two steps, focusing on only one conversion at a time. Students often confuse capacity and volume. Capacity units are generally applied to liquid measures. Since ounces are used for both weight and capacity measures, it is important to refer to fluid ounces (fl. oz.) when measuring capacity. Converting metric units is easier than converting customary units because the metric system is related to the decimal system. Emphasizing this connection to the place value system deepens students’ understanding. There are two related ways to approach conversions within the metric system that make this connection (Van de Walle, 2004). Converting units of measure within the customary or the metric system provides students an opportunity to attend to precision. As they make conversions, they need to check the reasonableness of their results. Students who can apply the techniques on this page will be able to evaluate the reasonableness of their results.

Students with conceptual knowledge of two-dimensional figures understand the relationship among the shapes and that the definitions of many quadrilaterals are hierarchical in nature (Casa & Gavin, 2009). A deep understanding of volume includes understanding the multiplicative relationship between the height of an object and its cross-sectional area (Battista, 2007). The obvious challenge is that it is difficult for students to visualize the layer structure of three-dimensional solids (Outhred, Mitchelmore, McPhail, & Gould, 2003). Extensive experience with a variety of concrete representations of three-dimensional solids and volume leads to students understanding volume as the product of area and height (NRC, 2001). The study of geometry and volume offers many opportunities for students to interact with other students and listen to their arguments and justifications. This may occur when students examine defining attributes and properties of figures. As students create definitions based on properties of figures and discuss with their classmates whether or not certain figures have the properties to meet specific definitions, they have ample opportunities to construct viable arguments and critique the reasoning of others.

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Enduring Understandings

- Analyze patterns and relationships.
- Represent and interpret data.
- Graph points on a coordinate plane to solve real-world and mathematical problems.
- Convert like measurements within a given measurement system.
- Understand concepts of volume and relate volume to multiplication and to addition.
- Classify two-dimensional figures into categories.

Essential Questions

- How can a line plot help you find an average with data given in fractions?
- How can you identify and plot points on a coordinate grid?
- How can you identify a relationship between two numerical patterns?
- How can you compare and convert customary units of length, capacity, weight and metric units?
- How can you identify, describe, and classify two-dimensional and three-dimensional figures?
- How can you find the volume of a rectangular prism using a model and the formula?
- How can you find the volume of composite rectangular prisms?

Assessments

Possible Formative Assessments
<ul style="list-style-type: none">• Teacher Observation• Student Participation• One-to-One Conferring• Small Strategy Groups• LinkIt! Progress Reports• DreamBox Progress Reports
Summative Assessments
<ul style="list-style-type: none">• Chapter Quizzes & Tests<ul style="list-style-type: none">◦ Ch. 9, 10, and 11 Go Math!• Student Self-Reflection by Chapter• Chapter Performance Tasks (as appropriate)• Online Math Activity Scores
Alternative Assessments
<ul style="list-style-type: none">• Modified Unit Assessment• Modified Chapter Assessment

Standards (NJSL) Addressed in this Unit

Operations and Algebraic Thinking 5.OA
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

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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.

Measurement and Data 5.MD

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.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.

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

- a. 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.
- b. 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.

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.

5.MD.C.5.a. 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.

5.MD.C.5.b. 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.

5.MD.C.5.c. 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.

Geometry 5.G

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.

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

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

Career Readiness, Life Literacies, and Key Skills

LIFE LITERACIES AND KEY SKILLS

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

PRACTICES

- **CLKSP4** Demonstrate creativity and innovation.
- **CLKSP5** Utilize critical thinking to make sense of problems and persevere in solving them.
- **CLKSP8** Use technology to enhance productivity, increase collaboration, and communicate effectively.

Interdisciplinary Connections:

English Language Arts

Writing

- **W.5.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.5.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Reading

- **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.
- **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- **RI.5.8.** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

Speaking & Listening

- **SL.5.3.** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence

Standards for Mathematical Practice

- MP1 - Make sense of problems and persevere in solving them.
- MP2 - Reason abstractly and quantitatively.
- MP3 - Construct viable arguments and critique the reasoning of others.

- MP4 - Model with mathematics.
- MP5 - Use appropriate tools strategically.
- MP6 - Attend to precision.
- MP7 - Look for and make use of structure.
- MP8 - Look for and express regularity in repeated reasoning.

Unit 4: Algebra, Measurement, Geometry and Volume

Algebra

Students will...

- Make and use line plots with fractions to solve problems.
- Graph and name points on a coordinate grid using ordered pairs.
- Collect and graph data on a coordinate grid.
- Analyze and display data in a line graph.
- Use two rules to generate a numerical pattern and identify the relationship between the corresponding terms in the patterns.
- Solve problems using the strategy “solve a simpler problem.”
- Graph the relationship between two numerical patterns on a coordinate grid.

Measurement

Students will...

- Compare, contrast, and convert customary units of length, capacity, and weight.
- Convert measurement units to solve multi-step problems.
- Compare, contrast, and convert Metric units.
- Solve problems about Customary and Metric conversions using the strategy to make a *table*.
- Convert units of time to solve elapsed time problems.

Geometry

Students will...

- Identify and classify polygons.
- Classify and draw triangles using their properties.
- Classify and compare quadrilaterals using their properties.

Volume

Students will...

- identify, describe, and classify three dimensional figures.
- Understand unit cubes and how they can be used to build a solid figure.
- Count unit cubes that fill a solid figure to find volume.
- Estimate the volume of a rectangular prism.
- Find the volume of a rectangular prism.
- Use a formula to find the volume of a rectangular prism.
- Use the strategy “make a table” to compare volumes.

- Find the volume of combined rectangular prisms.

Unit Specific Vocabulary

Base (of a power)	Ordered Pair
Capacity	Origin Scale
Congruent Figures	Polygon
Coordinate Grid	Polyhedron
Data	Prism
Decimeter	Pyramid
Dekameter	Quadrilateral
Equilateral Triangle	Regular Polygon
Heptagon	Scalene Triangle
Interval	Ton (T)
Isosceles Triangle	Unit Cube
Lateral Face	Volume
Line Graph	Weight
Line Plot	x-axis
Mass	x-coordinate
Milligram (mg)	y-axis
Milliliter (mL)	y-coordinate
Nonagon	

Suggested Modifications and Accommodations

These strategies can be adapted to scaffold for students needing more support or extend the learning for higher level students. Differentiation is accomplished through content, process, product, and learning environment.

Instructional Materials and Learning Activities

Core Instructional Materials:

- *Go Math 5* © 2015 - Houghton Mifflin Harcourt
 - Teacher Edition, Student Workbooks, Unit Assessments, Student Reference Book, Activity Cards, Blackline Masters

Supplemental Materials:

- STEAM Integration: [UNIT 7](#) - Hunger Games
- Bridges in Mathematics for intervention
- Digital Resources:
 - *Think Central*® Digital (<https://www-k6.thinkcentral.com>)
 - ebooks, eToolkit, eTeacher's Manual, eStudent Books, online resources
 - Online Practice Assignments (Includes but not limited to: IXL, Xtra Math)
 - [Grade 5 - eGlossary](#)
 - Bridges in Mathematics (<https://bridges.mathlearningcenter.org/>) for intervention
 - DreamBox

Special Education Students

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- Use various methods to understand a student's learning style, i.e.- observation, surveys, conferring.
- Ask students to recall what they have already learned in ways that activate prior knowledge and build on that knowledge.
- Model problem-solving processes.
- Model productive and engaging partner talk.
- Provide direct instruction and/or think aloud for clarity.
- Build and/or use anchor charts with students and continually refer to them while teaching.
- Provide opportunities for students to turn and talk.
- Use modeling and manipulatives.
- Provide graphic organizers for making inferences when possible.
- Use step-by-step how-to sheets to guide student problem-solving.
- Refer to student IEP goals and modifications.
- Use pre-assessment data to drive instruction.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Use a problem [solving plan](#) to organize mathematical thinking.
- Incorporate [place value charts](#) into small group lessons.

Students at Risk

- [Skills Review Handbook](#)
- Shorten assignments.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- [Brainpop - Graphs](#)
- [Brainpop - Coordinate Plane](#)
- [Brainpop - Graph Linear Equations](#)
- [Brainpop - Customary Units](#)
- [Brainpop - Metric Units](#)
- [Brainpop - Metric and Customary comparison](#)
- [Brainpop - Elapsed Time](#)
- [Brainpop - Polygons](#)
- [Brainpop - Types of Triangles](#)
- [Brainpop - 3D shapes \(polyhedrons\)](#)
- [Brainpop - Volume of Prisms](#)
- [Khan Academy - Introduction to Line Plots](#)
- [Khan Academy - Introduction to Coordinate Plane](#)
- [Khan Academy - Relationships and Patterns in Ordered Pairs](#)
- [Khan Academy - How to Read a Line Graph](#)
- [Khan Academy - Numerical Patterns](#)
- [Khan Academy - Introduction to Length](#)

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- [Khan Academy - Introduction to Weight](#)
- [Khan Academy - Introduction to Capacity](#)
- [Khan Academy - Practice Converting Customary Units](#)
- [Khan Academy - Multi-Step Customary conversions](#)
- [Khan Academy - Convert Capacity](#)
- [Khan Academy - Quadrilateral Properties/Hierarchy](#)
- [Khan Academy - Recognizing Shapes](#)
- [Khan Academy - Classifying Triangles](#)
- [Khan Academy - Introduction to Volume](#)
- [Khan Academy - Volume of Rectangular Prisms](#)
- [Khan Academy - Volume of Rectangular Prism with Fractional Dimensions](#)
- [Khan Academy - Volume of Composite Figures](#)
- [Learnzillion- Understanding Place Value](#)
- [Learnzillion- Understanding Volume](#)
- [Learnzillion- Find Volume by Counting Cubes](#)
- [Learnzillion- Count Unit Cubes in a Rectangular Prism](#)
- [Learnzillion- Identify and Label Three-Dimensional Figures](#)
- [Learnzillion- Recognize that Volume is Additive by Finding the Volume of a 3D Figure Composed of Two Rectangular Prism](#)
- [Learnzillion- Find Volume by Multiplying the Area of the Base by the Height](#)
- [Learnzillion- Use Volume to Understand the Associative Property of Multiplication](#)
- [Learnzillion- Find the Missing Dimensions of the 3-D Figures Using the Volume Formula](#)
- [Learnzillion- Use Multiplication \(\$V=l \times w \times h\$ \) to Find the Volume of a Solid Figure](#)
- [Learnzillion- Find the Volume of Composed Rectangular Prisms](#)
- [Learnzillion- Convert a Smaller Metric Unit to a Larger Unit](#)
- [Learnzillion- Select Appropriate Measurement Conversions](#)
- [Learnzillion- Solve Real-World Distance Problems with Unit Conversions](#)
- [Always, Sometimes, Never \(Illustrative Mathematics\)](#)
- [Using Volume to Understand the Associative Property of Multiplication \(Illustrative Mathematics\)](#)

English Language Learners

- [Glossary of terms](#)
- Allow use of a bilingual dictionary.
- Allow use of handheld translator.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Set a writing goal for assignment and then focus only on that goal.

Gifted and Talented

- Provide opportunities to lead discussion.
- Use flexible grouping.
- Use projects, such as the following:
 - [Iditarod - Is it the last great race on Earth?](#)

- [Leaves are Pretty But...](#)
- [Do Teams That Spend a Lot Win a Lot?](#)
- [The Cost of Gas](#)
- [Collecting the Most Candy](#)
- [Canstruction](#)
- [Giant Iceberg!](#)
- [How Many Donuts is That?](#)
- [Jorge is Now 14 Years Old](#)
- [Wind Chill](#)
- [Meerkat Coordinate Plane Task \(Illustrative Mathematics\)](#)
- [What do These Shapes Have in Common? \(Illustrative Mathematics\)](#)
- [Converting Fractions of a Unit to a Smaller Unit \(Illustrative Mathematics\)](#)
- [Fractions on a Line Plot \(Illustrative Mathematics\)](#)
- [Cari's Aquarium \(Illustrative Mathematics\)](#)
- [Breaking Apart Composite Solids \(Illustrative Mathematics\)](#)
- [Sidewalk Patterns \(Illustrative Mathematics\)](#)

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- *Extra Practice* activities
- Preferential Seating
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- Establish and maintain eye contact when giving oral directions
- Directions repeated and/or clarified
- Provide copy of class notes
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- Reduce homework amount
- Modify assessments

Social-Emotional Learning Competencies

- **Self-Awareness:** ability to recognize one's emotions and know one's strengths and limitations
 - Connections:
 - Reflecting on one's learning (Oral, Thumbs Up, Thumbs Down, Pictures, etc.)
- **Self-Management:** ability to regulate and control one's emotions and behaviors, particularly in stressful situations
 - Connections:
 - Visit the mindfulness/cool down corner in the classroom for self-soothing activities (Squishy ball, sand timer, fidget popper, etc.)
- **Social Awareness:** ability to take the perspective of others, demonstrate empathy, acknowledge and appreciate similarities and differences, and understand how

one's actions influence and are influenced by others

- Connections:
 - Students collaborate and help each other during math centers
- **Relationship Skills:** refers to one's ability to demonstrate prosocial skills and behaviors in order to develop meaningful relationships and resolve interpersonal conflicts
 - Connections:
 - Class discussions
 - Incentives for individual students and small groups
- **Responsible Decision-Making:** refers to the ability to use multiple pieces of information to make ethical and responsible decisions
 - Connections:
 - Class rules and routines
 - Class discussions
 - Following directions for math centers

5th Grade Math Curriculum

Unit 5: Real-World Application

Unit Overview: Many, if not all, future careers involve some capacity of mathematics and a strong foundation at the elementary level is necessary in order to compete with other countries. The United States is falling behind other countries in academic achievement, specifically math. Students need more opportunities for hands-on learning and real-world applications in order to keep interest in the mathematics they are learning. Providing projects like these will encourage critical thinking and reasoning skills which could create a better retention rate for the material learned.

In this [student-centered project](#) unit, 5th graders will work with math and financial literacy. Students will practice decimals and money skills while creating a budget. Throughout this project, students choose their career, car, and house. Their choices may be limited depending on the salary they get with their career. During this project, they will practice percentages and decimal operations (multiplication, division, addition, and subtraction).

Enduring Understandings

- How can a person create a balanced budget that allows for both spending and for saving?
- What are the components of financial planning and why are they important?
- Why is a budget such a key component of the financial plan?

Essential Questions

- Understand the importance of good financial planning.
- Identify and describe the key components of a financial plan.
- Apply an understanding of cash inflow and outflow in order to make financial decisions.

Assessments

Possible Formative Assessments
<ul style="list-style-type: none">• Teacher Observation• Student Participation• One-to-One Conferencing• Small Strategy Groups• LinkIt! Progress Reports• DreamBox Progress Reports
Summative Assessments
<ul style="list-style-type: none">• Student Self-Reflection by Chapter• Chapter Performance Tasks (as appropriate)• Online Math Activity Scores
Benchmark Assessments
<ul style="list-style-type: none">• LinkIt! Form C
Alternative Assessments
<ul style="list-style-type: none">• Modified Unit Assessment

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- Modified Chapter Assessment

Standards (NJSLs) Addressed in this Unit

Number and Operations in Base Ten

Understand the Place Value System

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.

Understand the Place Value System

5.NBT.A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Perform operations with multi-digit whole numbers and with decimals to hundredths

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

Perform operations with multi-digit whole numbers and with decimals to hundredths

5.NBT.B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Operations and Algebraic Thinking 5.OA

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

5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. 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.

Computer Science and Design Thinking

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.

Career Readiness, Life Literacies, and Key Skills

PERSONAL FINANCIAL LITERACY

9.1.5. EG.4: Describe how an individual’s financial decisions affect society and contribute to the overall economy.

9.1.5.CP.1: Identify the advantages of maintaining a positive credit history.

9.1.5.EG.1: Explain and give examples of what is meant by the term “tax.”

9.1.5.EG.3: Explain the impact of the economic system on one’s personal financial goals.

9.1.5.FP.2: Identify the elements of being a good steward of money.

9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.

9.1.5.FP.4: Explain the role of spending money and how it affects well-being and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).

9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

LIFE LITERACIES AND KEY SKILLS

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).

PRACTICES

- **CLKSP4** Demonstrate creativity and innovation.
- **CLKSP5** Utilize critical thinking to make sense of problems and persevere in solving them.
- **CLKSP8** Use technology to enhance productivity, increase collaboration, and communicate effectively.

Interdisciplinary Connections:

English Language Arts

Writing

- **W.5.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.5.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
- **W.5.9** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Reading

- **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.
- **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- **RI.5.8.** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

Speaking & Listening

- **SL.5.3.** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence

Standards for Mathematical Practice

MP1 - Make sense of problems and persevere in solving them.

MP2 - Reason abstractly and quantitatively.

MP3 - Construct viable arguments and critique the reasoning of others.

MP4 - Model with mathematics.

MP5 - Use appropriate tools strategically.

MP6 - Attend to precision.

MP7 - Look for and make use of structure.

MP8 - Look for and express regularity in repeated reasoning.

Unit 5: Real World Application

Real World Application

Students will...

- Add, subtract, multiple, and divide decimals.
- Define income tax, payroll tax, sales tax, and property tax.
- Explain the difference between gross income and net income.
- Identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments.
- Describe actions that might be taken to balance a budget when expenses exceed income.
- Solve word problems by using real world examples and applying their knowledge throughout the project.

Unit Specific Vocabulary

Income tax
Budget
Gross income

Expense
Balanced budget
Net income

Suggested Modifications and Accommodations

These strategies can be adapted to scaffold for students needing more support or extend the learning for higher level students. Differentiation is accomplished through content, process, product, and learning environment.

Instructional Materials and Learning Activities

Core Instructional Materials:

- *Go Math 5* © 2015 - Houghton Mifflin Harcourt
 - Teacher Edition, Student Workbooks, Unit Assessments, Student Reference Book, Activity Cards, Blackline Masters
- [My Personal Budget PBL PowerPoint](#)
- [Create a Personal Budget Project-Based PDF](#)

Supplemental Materials:

- STEAM Integration: [UNIT 7](#) - Hunger Games
- Bridges in Mathematics for intervention
- Digital Resources:
 - *Think Central*® Digital (<https://www-k6.thinkcentral.com>)
 - ebooks, eToolkit, eTeacher's Manual, eStudent Books, online resources
 - Online Practice Assignments (Includes but not limited to: IXL, Xtra Math)
 - [Grade 5 - eGlossary](#)
 - Bridges in Mathematics (<https://bridges.mathlearningcenter.org/>) for intervention
 - DreamBox

Special Education Students

- Use various methods to understand a student's learning style, i.e.- observation, surveys, conferring.
- Ask students to recall what they have already learned in ways that activate prior knowledge and build on that knowledge.
- Model problem-solving processes.
- Model productive and engaging partner talk.
- Provide direct instruction and/or think aloud for clarity.
- Build and/or use anchor charts with students and continually refer to them while teaching.
- Provide opportunities for students to turn and talk.
- Use modeling and manipulatives.
- Provide graphic organizers for making inferences when possible.
- Use step-by-step how-to sheets to guide student problem-solving.
- Refer to student IEP goals and modifications.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Use a problem [solving plan](#) to organize mathematical thinking.
- Incorporate [place value charts](#) into small group lessons.

Students at Risk

- [Skills Review Handbook](#)
- Shorten assignments.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.
- Provide frequent breaks.
- Go Math! Grab-and-Go! Differentiated Centers Kit

English Language Learners

- [Glossary of Terms](#)
- Allow use of a bilingual dictionary.
- Allow use of handheld translator.
- Ask students to recall what they already learned in ways that activate their prior knowledge.
- Use pre-assessment data to drive instruction.
- Use preferential seating.
- Use flexible grouping.
- Model productive and engaging partner talk.
- Allow for extended time.
- Provide guided notes as necessary.

Gifted and Talented

- Provide opportunities to lead discussion.
- Use flexible grouping.
- Use projects in Units 1-4
- [Let's Get Cooking! \(Fraction Activity\)](#)
- [Plan a Party \(with a budget\)](#)
- [Plan a Road Trip \(add & multiply decimals\)](#)
- [Book Club Order Shopping \(add, subtract & multiply decimals\)](#)
- [Plan/Set up a Classroom and Supply List \(all operations\)](#)
- [Geometry Project \(review terms & make a piece of Art\)](#)

Students with 504 Plans

- *Readiness* activities
- *Extra Practice* activities
- Preferential Seating
- Monitor On-Task Performance
- Establish and maintain eye contact when giving oral directions
- Directions repeated and/or clarified
- Provide copy of class notes
- Homework does not impact grade in class
- Reduce homework amount
- Modify assessments

Social-Emotional Learning Competencies

- **Self-Awareness:** ability to recognize one's emotions and know one's strengths and limitations
 - Connections:
 - Reflecting on one's learning (Oral, Thumbs Up, Thumbs Down, Pictures, etc.)
- **Self-Management:** ability to regulate and control one's emotions and behaviors, particularly in stressful situations
 - Connections:
 - Visit the mindfulness/cool down corner in the classroom for self-soothing activities (Squishy ball, sand timer, fidget popper, etc.)
- **Social Awareness:** ability to take the perspective of others, demonstrate empathy, acknowledge and appreciate similarities and differences, and understand how one's actions influence and are influenced by others
 - Connections:
 - Students collaborate and help each other during math centers

- **Relationship Skills:** refers to one’s ability to demonstrate prosocial skills and behaviors in order to develop meaningful relationships and resolve interpersonal conflicts
 - Connections:
 - Class discussions
 - Incentives for individual students and small groups

- **Responsible Decision-Making:** refers to the ability to use multiple pieces of information to make ethical and responsible decisions
 - Connections:
 - Class rules and routines
 - Class discussions
 - Following directions for math centers