Everyday Mathematics®

The University of Chicago School Mathematics Project

GRADE 5

REVIEWER'S GUIDE & LESSON SAMPLER

Mc Graw Hill

Reviewing *Everyday Mathematics*

For over 35 years, *Everyday Mathematics* has helped teachers transform how they deliver math instruction. Since the first edition, the program has incorporated research-based practices such as problem-based instruction, flexible grouping strategies, math discourse, and productive struggle. These features are woven into core instruction rather than appearing as labels or stand-alone parts of the lesson.

> The authors have created a unique tool called "Planning for Rich Mathematical Instruction" to help teachers and reviewers see where these practices appear in lessons and specific activities.
> *See page xx for more information.*

Everyday Mathematics remains the only program that dedicates the time and resources required to develop research-based learning trajectories that are carefully designed to spiral both practice and instruction over time, which has been proven to be the most effective of way of achieving true, life-long mastery of mathematics skills and concepts.

> To help teachers and reviewers see the coherence of the spiral, the authors have created tools such as the spiral tracker which shows how each standard progresses across lessons and units.
> *See page xxx for more information.*

Features

Content

PeopleImages/Getty Images

The *Everyday Mathematics* Classroom

A pervasive element of an *Everyday Mathematics* classroom is collaborative learning. Working collaboratively in classrooms creates an atmosphere for sharing ideas and problem-solving strategies. As students encounter different ways of solving problems from peers, they learn to interpret and evaluate each other's point of view and engage in discussions that address the strengths and weaknesses of a variety of approaches.

Each lesson activity includes recommendations for one or more grouping options, helping you create a flexible, dynamic learning environment every day.

An Investment in How Your Children Learn

Behind each student success story is a team of teachers and administrators who set high expectations for themselves and their students. *Everyday Mathematics* is designed to help you achieve those expectations with a research-based approach to teaching mathematics.

The *Everyday Mathematics* Difference

Decades of research show that students who use *Everyday Mathematics* develop deeper conceptual understanding and greater depth of knowledge than students using other programs. They develop powerful, life-long habits of mind such as perseverance, creative thinking, and the ability to express and defend their reasoning.

Daniel LaFlor/Vetta/Getty Images

A Commitment to Educational Equity

Everyday Mathematics was founded on the principle that every student can and should learn challenging, interesting, and useful mathematics. The program is designed to ensure that each of your students develops positive attitudes about math and powerful habits of mind that will carry them through college, career, and beyond.

Provide Multiple Pathways to Learning

Through *Everyday Mathematics*' spiraling structure, your students develop mastery by repeatedly experiencing math concepts in varied contexts, with increasing sophistication, over time. By providing multiple opportunities to access math concepts, you can easily adapt your instruction to better meet the unique learning needs of your children.

Access High Quality Materials

All students deserve strong learning materials especially in early childhood. You can be confident teaching with *Everyday Mathematics* because your instruction is grounded in a century of research in the learning sciences and has been rigorously field tested and proven effective in classrooms for over thirty years.

Use Data to Drive Your Instruction

Using the Quick-Entry Evaluation tool in the ConnectED Teacher Center, you can go beyond tracking progress solely through periodic assessments and easily record evaluations of almost every activity your students engage in every day. The data you collect drives a suite of reports that help you tailor your instruction to meet the needs of every student in your classroom.

Create a System for Differentiation in Your Classroom

Turn your classroom into a rich learning environment that provides multiple avenues for each of your students to master content, make sense of ideas, develop skills, and demonstrate what they know. *Everyday Mathematics* helps you do this by providing the tools you need to effectively address the key components of effective differentiation in your classroom: Content, Process, Product, Classroom Organization, and Learning Environment.*

Build and Maintain Strong Home-School Connections

Research shows that strengthening the link between home and school is integral to your students' success. That's why *Everyday Mathematics* provides a wealth of resources to help you extend what your students learn in your classroom to what they can do at home.

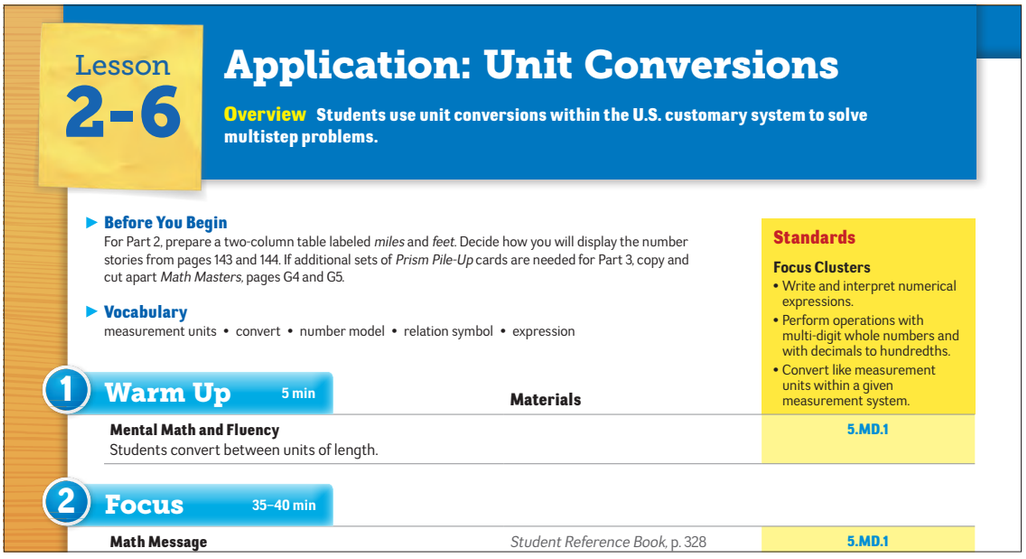
*Tomlinson & Murphy, M (2015). Leading for Differentiation: Growing Teachers Who Grow Kids. ASCD.

Build Mathematical Literacy

Designed for College and Career Readiness, *Everyday Mathematics* builds a solid foundation for success in your mathematics classroom through meaningful practice opportunities, discussion of reasoning and strategies, and engagement in the mathematical practices every day.

Focused Instruction

The instructional design of *Everyday Mathematics* allows you to focus on the critical areas of instruction for each grade.



Lesson 2-6

Application: Unit Conversions

Overview **Students use unit conversions within the U.S. customary system to solve multistep problems.**

▶ **Before You Begin**

For Part 2, prepare a two-column table labeled *miles* and *feet*. Decide how you will display the number stories from pages 143 and 144. If additional sets of *Prism Pile-Up* cards are needed for Part 3, copy and cut apart *Math Masters*, pages G4 and G5.

▶ **Vocabulary**

measurement units • convert • number model • relation symbol • expression

Standards

Focus Clusters

- Write and interpret numerical expressions.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Convert like measurement units within a given measurement system.

1 Warm Up 5 min — **Materials**

Mental Math and Fluency — 5.MD.1

Students convert between units of length.

2 Focus 35–40 min

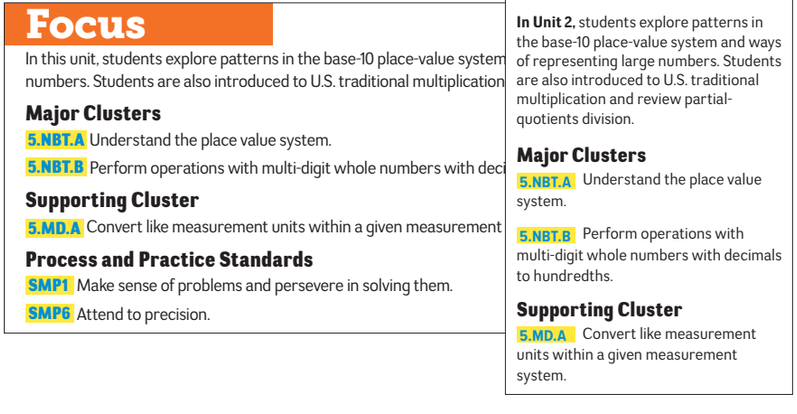
Math Message — *Student Reference Book*, p. 328 — 5.MD.1

Focus Clusters

Everyday Mathematics identifies the clusters addressed in the Focus part of each lesson to help you understand the content that is being taught in the lesson.

Major Clusters

Each unit focuses on Major Clusters that are clearly identified in the Unit Organizer.



Focus

In this unit, students explore patterns in the base-10 place-value system numbers. Students are also introduced to U.S. traditional multiplication

Major Clusters

5.NBT.A Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers with deci

Supporting Cluster

5.MD.A Convert like measurement units within a given measurement

Process and Practice Standards

SMP1 Make sense of problems and persevere in solving them.

SMP6 Attend to precision.

Focus

In Unit 2, students explore patterns in the base-10 place-value system and ways of representing large numbers. Students are also introduced to U.S. traditional multiplication and review partial-quotients division.

Major Clusters

5.NBT.A Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers with decimals to hundredths.

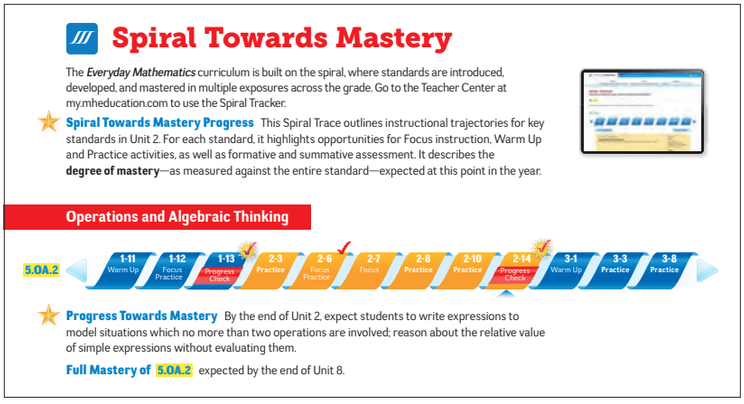
Supporting Cluster

5.MD.A Convert like measurement units within a given measurement system.

Coherence Within and Across Grades

Spiral Towards Mastery

Carefully crafted, research-based learning progressions provide opportunities for your students to connect skills, concepts, and applications, while developing deep understanding, long-term learning, and transfer of knowledge and skills to new contexts.



Spiral Towards Mastery

The ***Everyday Mathematics*** curriculum is built on the spiral, where standards are introduced, developed, and mastered in multiple exposures across the grade. Go to the Teacher Center at my.mheducation.com to use the Spiral Tracker.

Spiral Towards Mastery Progress This Spiral Trace outlines instructional trajectories for key standards in Unit 2. For each standard, it highlights opportunities for Focus instruction, Warm Up and Practice activities, as well as formative and summative assessment. It describes the **degree of mastery**—as measured against the entire standard—expected at this point in the year.

Operations and Algebraic Thinking

5.OA.2 — 1-11 Warm Up | 1-12 Focus Practice | 1-13 Progress Check | 2-3 Practice | 2-6 Focus Practice | 2-7 Focus | 2-8 Practice | 2-10 Practice | 2-14 Progress Check | 3-1 Warm Up | 3-3 Practice | 3-8 Practice

Progress Towards Mastery By the end of Unit 2, expect students to write expressions to model situations which no more than two operations are involved; reason about the relative value of simple expressions without evaluating them.

Full Mastery of 5.OA.2 expected by the end of Unit 8.

Coherence

The table below describes how standards addressed in the Focus parts of the lessons link to the mathematics that students have done in the past and will do in the future.

	Links to the Past	Links to the Future
5.OA.1	In Unit 1, students reviewed how to use grouping symbols in expressions and how to evaluate expressions with grouping symbols. In Grade 3, students inserted parentheses in number sentences to make them true and evaluated number sentences with parentheses.	In Unit 7, students will use grouping symbols in an expression to model how to solve a multistep problem about gauging reaction time. In Grade 6, students will evaluate expressions and perform operations according to the Order of Operations.
5.OA.2	In Unit 1, students represented the volumes of rectangular prisms using expressions. They also wrote expressions to record calculations in the game *Name That Number.* In Grade 4, students represented problems using equations with a letter standing for an unknown quantity.	Throughout Grade 5, students will write expressions to record calculations in a variety of contexts. In Unit 6, they will order and interpret expressions without evaluating them. In Grade 6, students will write expressions in which letters stand for numbers.

Linking Prior and Future Knowledge

Each unit contains information about how the focus standards covered in the unit developed in prior units and grades and how your instruction lays the foundation for future lessons.

Rigorous Content

Everyday Mathematics gives you the tools and resources you need to emphasize conceptual understanding, procedural fluency, and applications with equal intensity.

Planning for Rich Math Instruction

		2-1 Understanding Place Value	2-2 Exponents and Powers of 10	2-3 Applying Powers of 10	2-4 U.S. Traditional Multiplication, Part 1
RIGOR	**Conceptual Understanding**	**The relationship between places in multidigit numbers** Describing Place-Value Relationships, p. 112 Representing Place Value, p. 113	**Exponential notation** Introducing Powers of 10, p. 118	**Estimation** Estimating with Powers of 10, p. 125	**Multidigit multiplication** Introducing U.S. Traditional Multiplication, p. 130
	Procedural Skill and Fluency	Home Link 2-1, p. 115	Journal p. 44, #1	Math Message, p. 124 Using Powers of 10 to Multiply, p. 124 Readiness, p. 123 Extra Practice, p. 123	Mental Math and Fluency, p. 130 Math Message, p. 130 Introducing U.S. Traditional Multiplication, p. 130 Multiplying 2-Digit Numbers by 1-Digit Numbers, p. 132 Home Link 2-4, p. 133 Readiness, p. 129 Enrichment, p. 129 Extra Practice, p. 129
	Applications		Introducing Powers of 10, p. 118 Solving a Real-World Volume Problem, p. 121 Enrichment, p. 117	Estimating with Powers of 10, p. 125 Writing and Comparing Expressions, p. 127 Home Link 2-3, p. 127	Multiplying 2-Digit Numbers by 1-Digit Numbers, p. 132

Problem-based Instruction

Everyday Mathematics builds problem solving into every lesson. Problem solving is in everything they do.

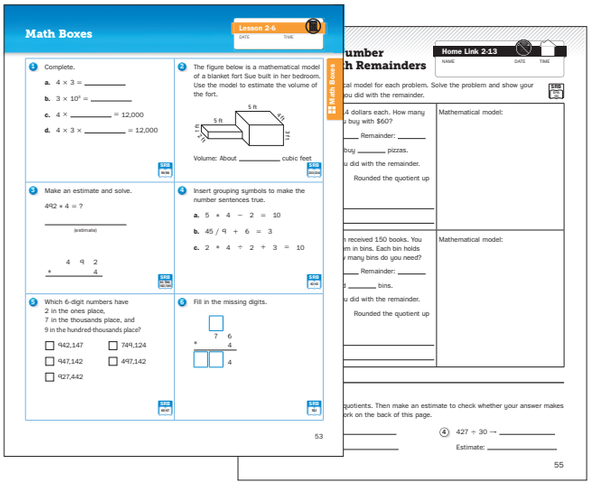
Warm-up Activity	Daily Routines	Math Message	Focus Activities	Summarize	Practice Activities
Lessons begin with a quick, scaffolded Mental Math and Fluency exercise.	Reinforce and apply concepts and skills with daily activities.	Engage in high cognitive demand problem solving activities that encourage productive struggle	Introduce new content with group problem solving activities and classroom discussion.	Discuss and make connections to the themes of the focus activity.	Lessons end with spiraled review of content from past lessons.

Practice Embedded in Every Lesson

Because *Everyday Mathematics* is a problem-based curriculum, practice opportunities appear naturally in daily instruction, but specific activities in the practice part of lessons help you be confident your students are progressing toward mastery and maintaining and applying knowledge and skills over time.

Games

Provide opportunities for fluency practice, along with collaborative learning experiences.



Math Boxes

Provide students with an opportunity to recall previously taught skills and concepts. These are distributed practice activities that include a balance of skills, concepts, and applications.

Home Links

Allow students to practice school mathematics and help family members connect to school.

Mathematical Literacy Sets The Stage for Algebra

Everyday Mathematics encourages students to recognize, analyze, and generalize patterns; represent quantities and relationships symbolically; model problem situations using objects, pictures, words, and symbols; and understand real-world relationships such as direct proportion–which, along with a fluent mastery of basic arithmetic, are the building blocks of algebraic thinking.

GRADE	K	1	2	3	4	5	6
	Instruction builds on student curiosity about patterns to explore numbers, shapes, and relationships between them.		Students work with symbolic representations for quantities and relationships, model simple situations, and build arithmetic skills.			Students use symbolic representations to model problem situations, build their understanding of fundamental relations such as direct proportion, and master elementary arithmetic concepts and skills.	

Be the Teacher They Will Always Remember

An *Everyday Mathematics* classroom has a unique energy that's a result of student engagement and excitement about learning math. This environment builds growth mindset and other positive attitudes about learning that will help your students succeed long after they've left your classroom.

Math Talk

Talking about mathematics is an essential part of learning mathematics. Opportunities for students to share their problem-solving strategies and their reasoning as well as critique others' reasoning are embedded throughout *Everyday Mathematics,* making it easy for you to facilitate math discussions every day.

(t)Steve Debenport/Getty Images, (b)©KidStock/Blend Images LLC

"I can share my solution!"

Collaboration

Everyday Mathematics was designed to allow your students to share ideas and strategies. They work in small groups and with partners formed according to their needs, helping you create a rich learning environment that supports powerful instruction.

Perseverance and Productive Struggle

Everyday Mathematics helps you create a classroom culture that values and supports productive struggle, that fosters productive dispositions in your students—a belief that mathematics is worthwhile, an inclination to use the mathematics they know to solve problems and confidence in their own mathematical abilities.

"I can do this!"

Hands-on Exploration

Everyday Mathematics includes hands-on activities in every lesson that often involve the use of manipulatives and games to help students make connections to their everyday life. These activities allow students to model mathematics physically, concretely, and visually–deepening their understanding of concepts and skills.

The *Everyday Mathematics* Lesson

Lessons are designed to help teachers facilitate instruction and engineered to accommodate flexible grouping models. The three-part, activity-driven lesson structure helps you easily incorporate research-based instructional methods into your daily instruction.

Embedded Rigor and Spiraled Instruction

Each lesson weaves new content with practice of content introduced in earlier lessons. The structure of the lessons ensures that your instruction includes all elements of rigor in equal measure with problem solving at the heart of everything you do.

Review
Warm Up
FLUENCY

Lessons begin with quick, scaffolded warm up exercises that provide important fluency practice.

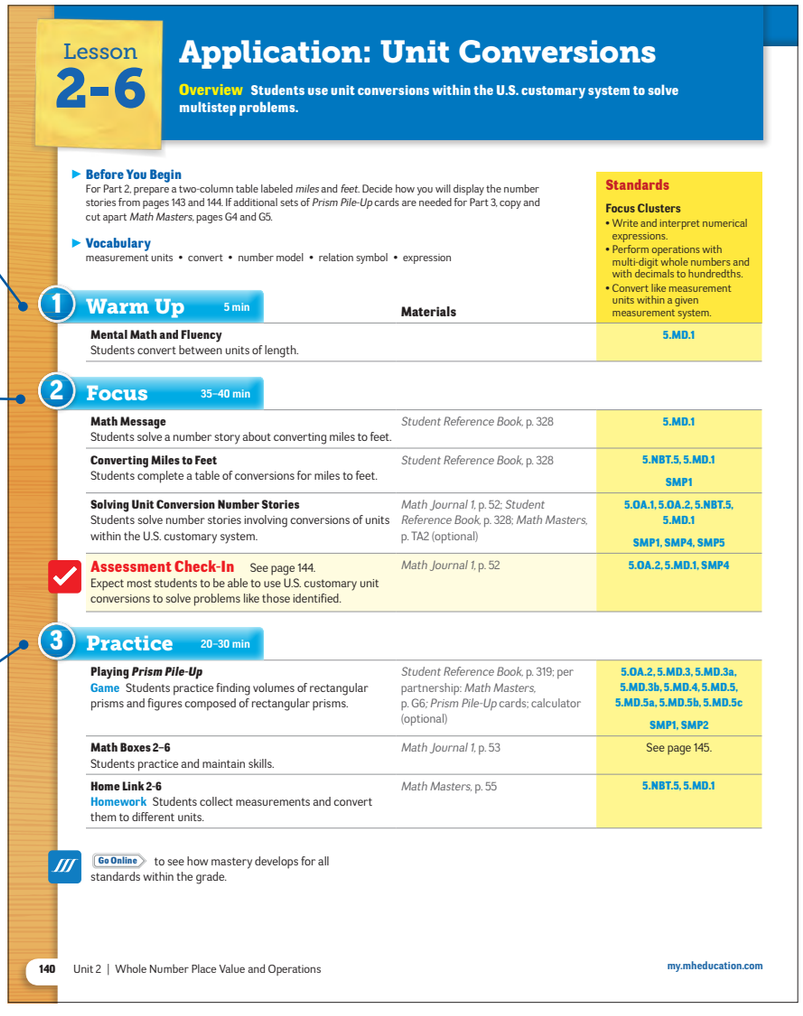
Introduction of New Content
Focus
CONCEPTUAL UNDERSTANDING AND APPLICATION

Math Message Students solve a challenging and engaging problem and discuss how they solved it.

Focus Activities Introduce new content, skills, and concepts.

Review
Practice
APPLICATION AND FLUENCY

Spiraled practice that revisits content from earlier lessons.



Lesson 2-6

Application: Unit Conversions

Overview **Students use unit conversions within the U.S. customary system to solve multistep problems.**

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Standards
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1 Warm Up 5 min

	Materials	Standards
Mental Math and Fluency Students convert between units of length.		5.MD.1

2 Focus 35–40 min

Math Message Students solve a number story about converting miles to feet.	*Student Reference Book*, p. 328	5.MD.1
Converting Miles to Feet Students complete a table of conversions for miles to feet.	*Student Reference Book*, p. 328	5.NBT.5, 5.MD.1 SMP1
Solving Unit Conversion Number Stories Students solve number stories involving conversions of units within the U.S. customary system.	*Math Journal 1*, p. 52; *Student Reference Book*, p. 328; *Math Masters*, p. TA2 (optional)	5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1 SMP1, SMP4, SMP5
Assessment Check-In See page 144. Expect most students to be able to use U.S. customary unit conversions to solve problems like those identified.	*Math Journal 1*, p. 52	5.OA.2, 5.MD.1, SMP4

3 Practice 20–30 min

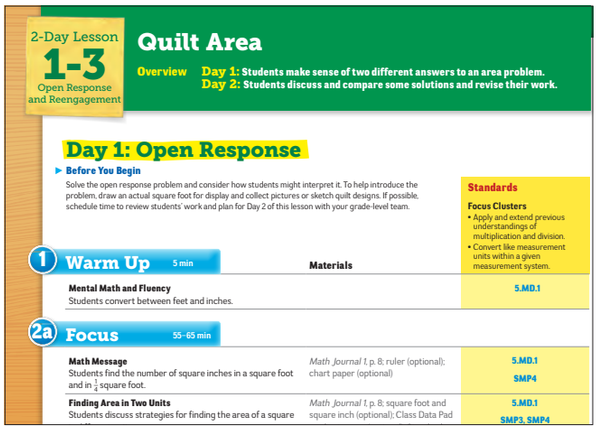
Playing *Prism Pile-Up* **Game** Students practice finding volumes of rectangular prisms and figures composed of rectangular prisms.	*Student Reference Book*, p. 319; per partnership: *Math Masters*, p. G6; *Prism Pile-Up* cards; calculator (optional)	5.OA.2, 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5, 5.MD.5a, 5.MD.5b, 5.MD.5c SMP1, SMP2
Math Boxes 2-6 Students practice and maintain skills.	*Math Journal 1*, p. 53	See page 145.
Home Link 2-6 **Homework** Students collect measurements and convert them to different units.	*Math Masters*, p. 55	5.NBT.5, 5.MD.1

Go Online to see how mastery develops for all standards within the grade.

140 Unit 2 | Whole Number Place Value and Operations my.mheducation.com

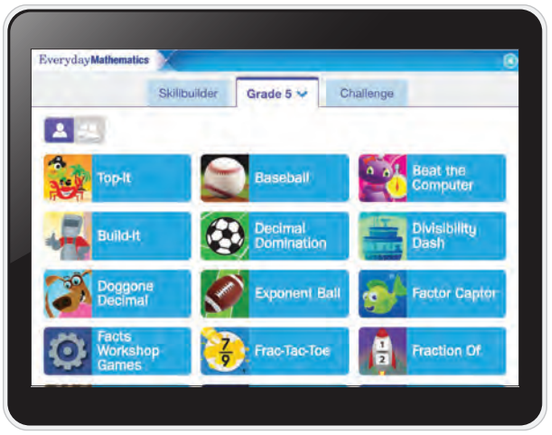
Key Components

The *Everyday Mathematics* authors have developed a suite of resources that support your instruction, helping you create a mathematically rich environment every day.



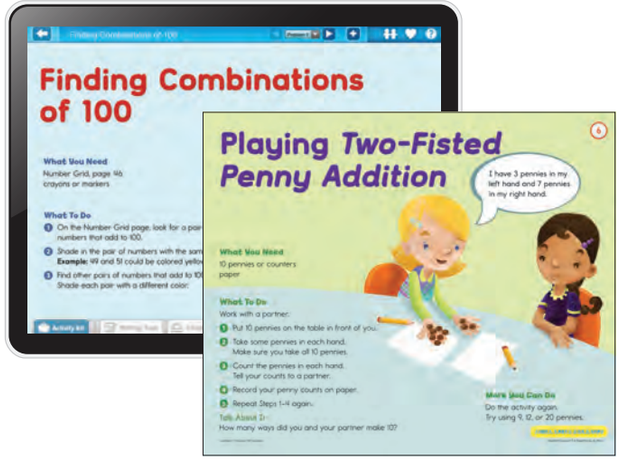
Open Response and Reengagement Lessons

Every unit includes a 2-day lesson that provides your students the opportunity to work with rich tasks and solve complex problems while explicitly engaging in the mathematical practices.



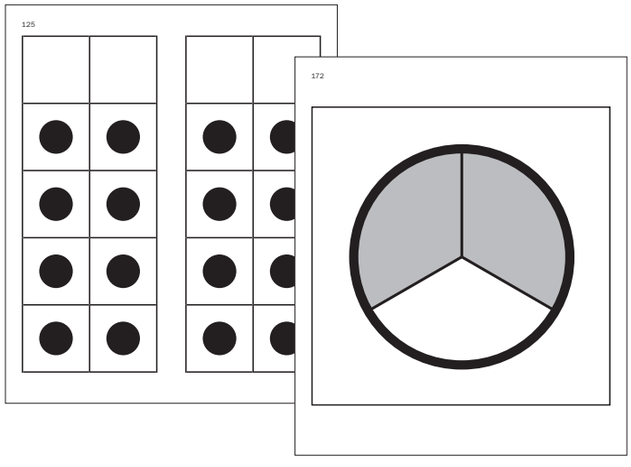
Games

Research shows that games provide a more effective learning experience than tedious drills and worksheets. Games allow for playful, repetitive practice that develops fluency and confidence and helps students learn to strategize.



Activity Cards

Activity Cards provide for structured exploration of content tied to the focus of the lesson independently, in partnerships, and in small groups, especially in centers, where students are expected to complete the activity with minimal teacher guidance.



Quick Looks

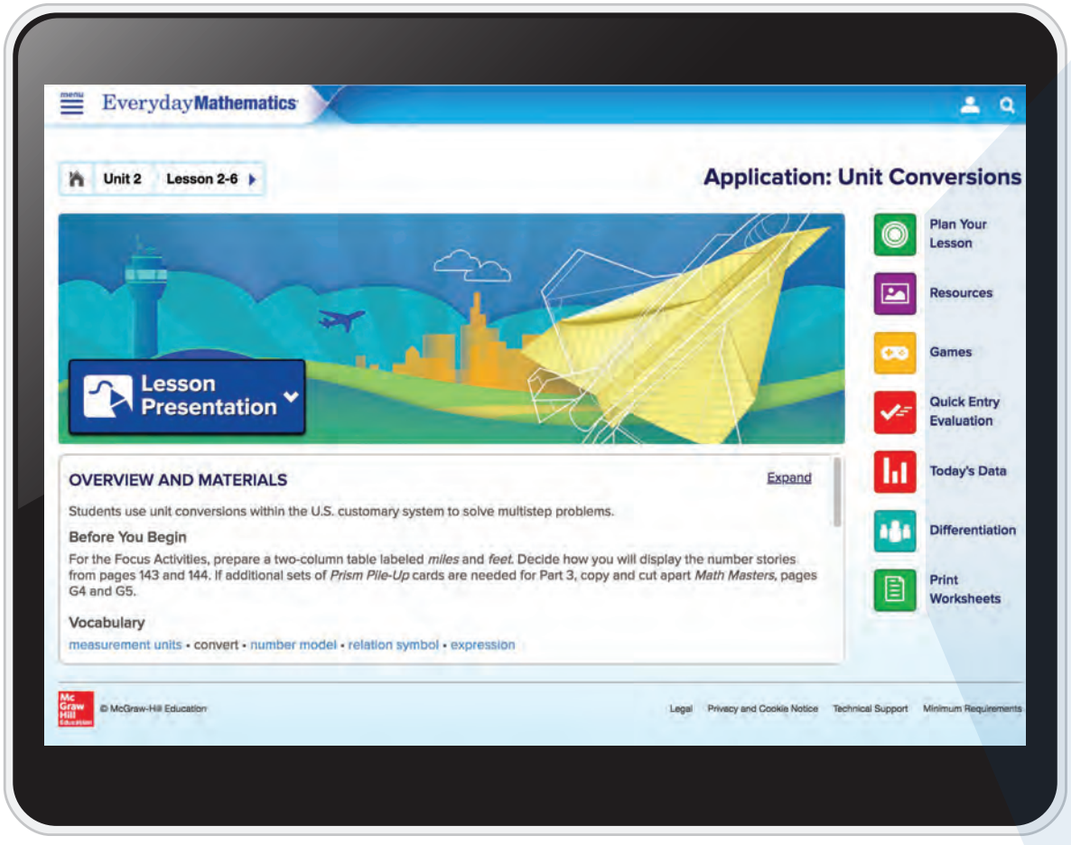
Quick Look activities are routines that help your students develop the ability to recognize a quantity without counting and to decompose numbers in various ways. As they encounter various combinations of numbers, they also develop strategies for basic facts.

Online Resources

Digital tools to help you confidently deliver effective mathematics instruction in your classroom are included with every implementation. Everything you need is included in one easy-to-navigate place and you can customize your lessons by adding resources and notes–and everything is saved and available to you year after year.

The Teacher Center

You'll never waste time looking for resources because everything you need for every lesson is right where you need it, when you need it. When you open the *Everyday Mathematics* Teacher Center, you're automatically taken to the overview of the current lesson.



Launch Presentation

Editable versions of digital lessons that help you lead instruction.

Plan Your Lesson

Review all of the activities for the lesson.

Resources

Access lesson resources, additional projects and home-school connections.

Games

Open online games for fluency practice.

Quick Entry

Easily record evaluations of your students' progress.

Today's Data

Easy access to Data Dashboard reports to drive your daily instruction.

Differentiation

Resources to help you adjust the lesson to support all learners.

The Student Learning Center

Engineered to help each of your students experience confidence and develop positive feelings about math in a digital environment that keeps them engaged and excited about learning.

Lesson Content

Your students' lessons are synched with your planner so they always have easy access to each day's activities.

My Reference Book

One-click access to the interactive reference book that includes descriptions and examples as well grade-level-appropriate explanations of mathematical content and practices.

eToolkit

eTools and writing tools that enable your students to show their work and explore dynamic extensions.

Geometer's Sketchpad Activities and EM Games Online

Easy to access Fact Practice games and full integration of The Geometer's Sketchpad® activities.

Tutorial Videos

Demonstrations of concepts and skills.

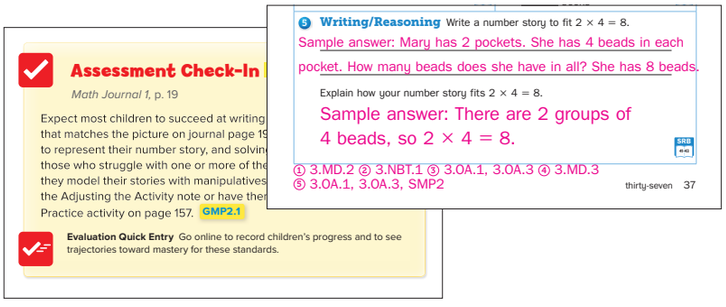
EM at Home

Parents have easy access to resources to help them support their child's learning.

Data Driven Instruction

Everyday Mathematics includes a complete set of tools and resources to help teachers evaluate the development of each student's mathematical understanding and skills, while providing actionable data to inform instruction.

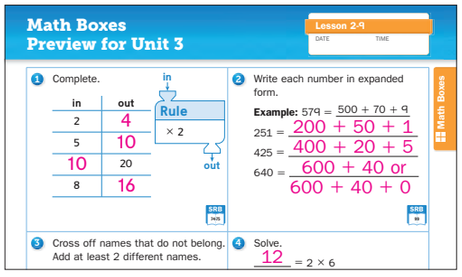
Evaluate



Ongoing Assessments

Assessment Check-In Daily lesson based assessment opportunities.

Writing and Reasoning Prompts Allow students to communicate understanding of concepts and skills and strategies for solving problems.



Pre Unit Assessment

Preview Math Boxes Appear in two lessons toward the end of each unit and help you gauge readiness for upcoming content, plan instruction and choose appropriate differentiation activities.

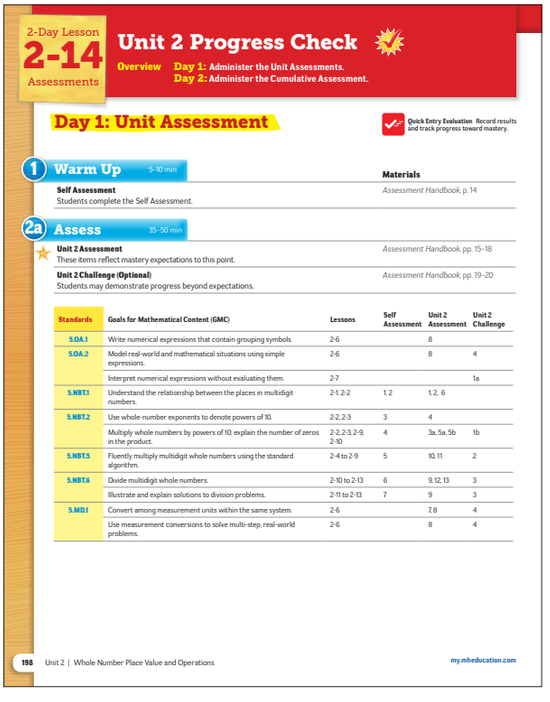
Data Dashboard Through the reports provided in the ConnectED Teacher Center, data recorded in prior units can provide valuable information to inform instruction in the upcoming unit.

Periodic Assessments

Progress Check lessons at the end of each unit provide formal opportunities to assess students' progress toward mastery of content and process/practice standards.

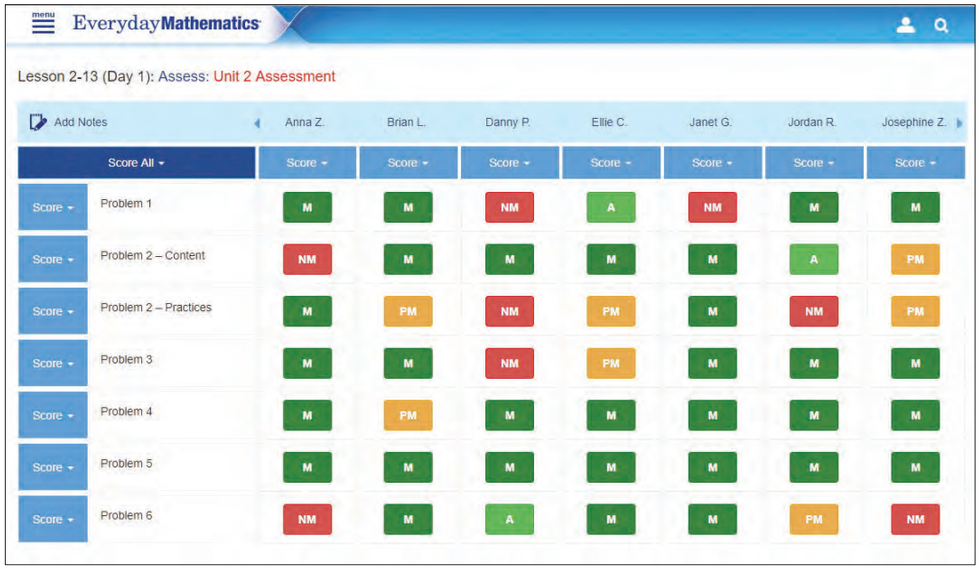
- **Unit Assessments** Assess students' progress toward mastery of concepts, skills, and applications in the current unit.
- **Self Assessments** Allow students to reflect on their understanding of content and process/practice standards that are the focus of the unit.
- **Challenge Problems** Extend important ideas from the unit, allowing students to demonstrate progress beyond expectations.
- **Cumulative Assessments** Assess students' progress toward mastery of content and process/ practice standards from prior units.
- **Open Response Assessments** Provide information about students' performance on longer, more complex problems and emphasize the process and practice standards for mathematics.

Benchmark Assessments Beginning of Year, Mid-Year, and End of Year benchmarks follow the same format as Unit Assessments.



Record

A full suite of tools including rubrics and class checklists are available to help you track your students' progress.

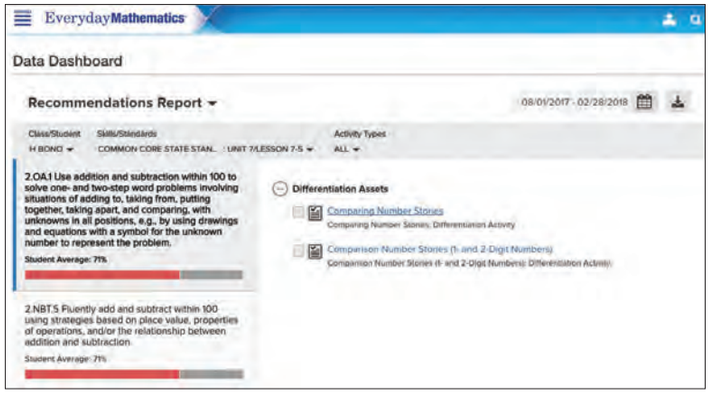


Quick Entry Evaluation Tool

You can quickly and efficiently record evaluations of your students' performance as well as add notes.

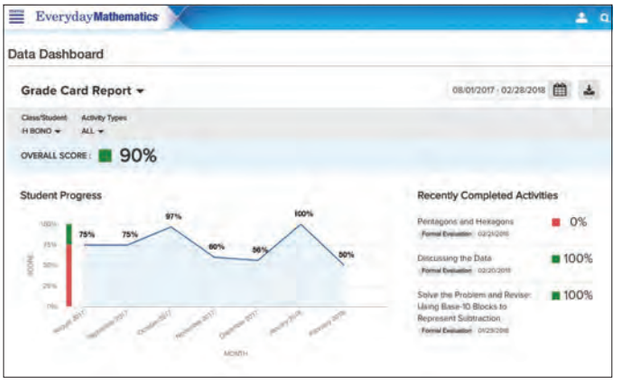
Report

The Data Dashboard is a responsive reporting tool that delivers actionable information to help you adapt and personalize your instruction and provide feedback to families and administrators.



Recommendations Report

Progress Report

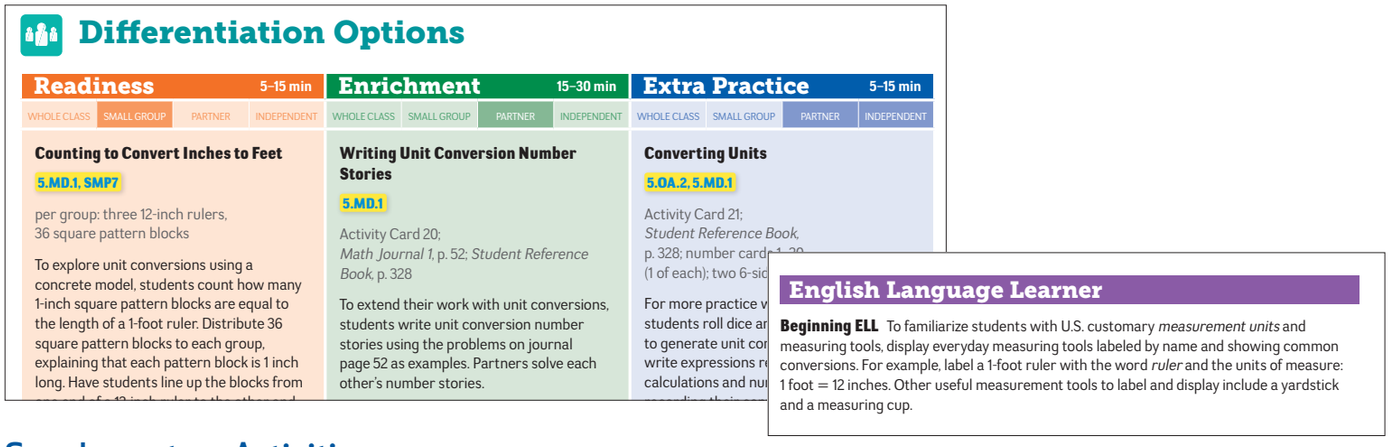


Grade Card Report

Differentiation System

Everyday Mathematics fosters rich learning environments that provide multiple avenues for mastering content, making sense of ideas, developing skills, and demonstrating knowledge. This allows rigorous mathematics content to be accessible and engaging for all students.

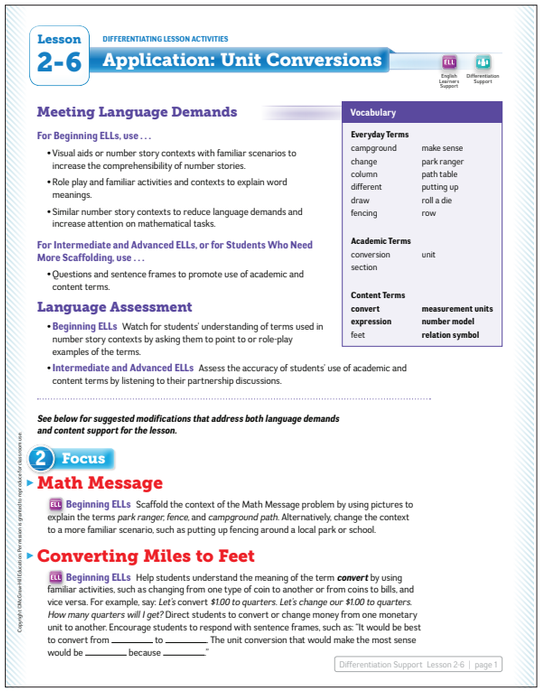
Everyday Mathematics Differentiation Model



Supplementary Activities

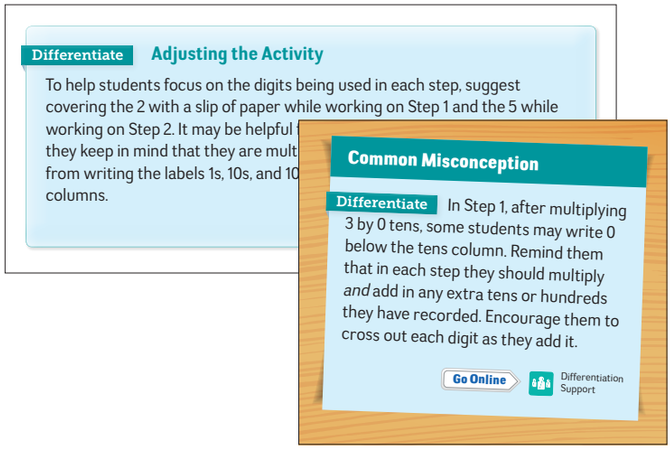
Everyday Mathematics offers specific differentiation options in every lesson for:

- Students who need more scaffolding
- Students who need extra practice
- Advanced Learners
- Beginning English Language Learners
- Intermediate and Advanced English Language Learners



Lesson Supplements

Almost every lesson has Differentiation Support Pages found in the ConnectED Teacher Center that offer extended suggestions for working with diverse learners, including English Language Learners and students who need more scaffolding.



Point-of-Use Differentiation

Assessment Adjustments Suggestions for scaffolding and extending Progress Check assessments.

Game and Activity Adjustments Recommendations for tools, visual aids, and other instructional strategies that provide immediate support.

Adjusting the Activity Suggestions for adapting activities to fit students' needs.

Common Misconceptions Notes that suggest how to use observations of students' work to adapt instruction.

Supporting Rich Mathematical Instruction

Everyday Mathematics includes a wealth of resources to help you deliver effective instruction every day.

Planning

Every Unit Organizer includes a chart that shows where the building-blocks for rich mathematical instruction appear throughout every unit.

Unit 2 Organizer

Planning for Rich Math Instruction

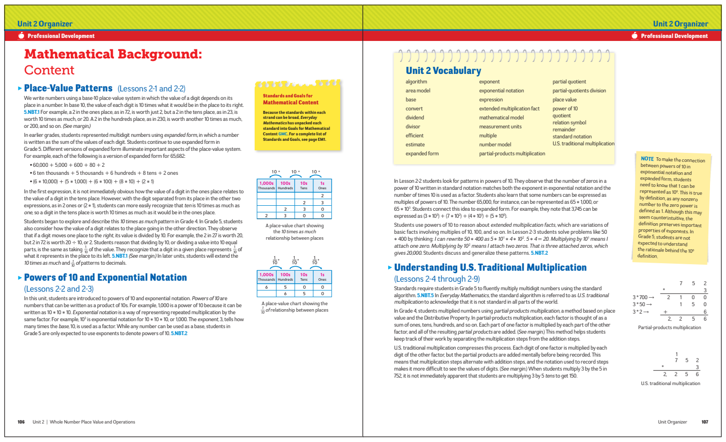
		2-1 Understanding Place Value	2-2 Exponents and Powers of 10	2-3 Applying Powers of 10	2-4 U.S. Traditional Multiplication, Part 1
RIGOR	**Conceptual Understanding**	**The relationship between places in multidigit numbers** Describing Place-Value Relationships, p. 112 Representing Place Value, p. 113	**Exponential notation** Introducing Powers of 10, p. 118	**Estimation** Estimating with Powers of 10, p. 125	**Multidigit multiplication** Introducing U.S. Traditional Multiplication, p. 130
RIGOR	**Procedural Skill and Fluency**	Home Link 2-1, p. 115	Journal p. 44, #1	Math Message, p. 124 Using Powers of 10 to Multiply, p. 124 Readiness, p. 123 Extra Practice, p. 123	Mental Math and Fluency, p. 130 Math Message, p. 130 Introducing U.S. Traditional Multiplication, p. 130 Multiplying 2-Digit Numbers by 1-Digit Numbers, p. 132 Home Link 2-4, p. 133 Readiness, p. 129 Enrichment, p. 129 Extra Practice, p. 129
RIGOR	**Applications**		Introducing Powers of 10, p. 118 Solving a Real-World Volume Problem, p. 121 Enrichment, p. 117	Estimating with Powers of 10, p. 125 Writing and Comparing Expressions, p. 127 Home Link 2-3, p. 127 Enrichment, p. 123	Multiplying 2-Digit Numbers by 1-Digit Numbers, p. 132
	Rich Tasks and Mathematical Reasoning	Journal p. 40: Writing/Reasoning Enrichment, p. 111	Math Message, p. 118 Introducing *High-Number Toss*, p. 120	Estimating with Powers of 10, p. 125 Enrichment, p. 123	Math Message, p. 130
	Mathematical Discourse	Representing Place Value, p. 113 Introducing Number Top-It, p. 114	Introducing Powers of 10, p. 118 Connecting Expanded Form and Exponential Notation, p. 120 Introducing *High-Number Toss*, p. 120 Extra Practice, p. 117	Estimating with Powers of 10, p. 125	Playing *Number Top-It*, p. 133
	Distributed Practice	Mental Math and Fluency, p. 112 Finding Volumes of Rectangular Prisms, p. 115 Math Boxes 2-1, p.115	Mental Math and Fluency, p. 118 Solving a Real-World Volume Problem, p.121 Math Boxes 2-2, p. 121	Mental Math and Fluency, p. 124 Writing and Comparing Expressions, p. 127 Math Boxes 2-3, p. 127	Mental Math and Fluency, p. 130 Playing *Number Top-It*, p. 133 Math Boxes 2-4, p. 133
	Differentiation Support	Differentiation Options, p. 111 ELL Support, p. 111 Online Differentiation Support 2-1 Adjusting the Activity, p. 113 Academic Language Development, p. 113	Differentiation Options, p. 117 ELL Support, p. 117 Online Differentiation Support 2-2 Common Misconception, p. 119	Differentiation Options, p. 123 ELL Support, p. 123 Online Differentiation Support 2-3 Common Misconception, p. 124 Common Misconception, p. 125 Academic Language Development, p. 125	Differentiation Options, p. 129 ELL Support, p. 129 Online Differentiation Support 2-4 Common Misconception, p. 132 Adjusting the Activity, p. 132

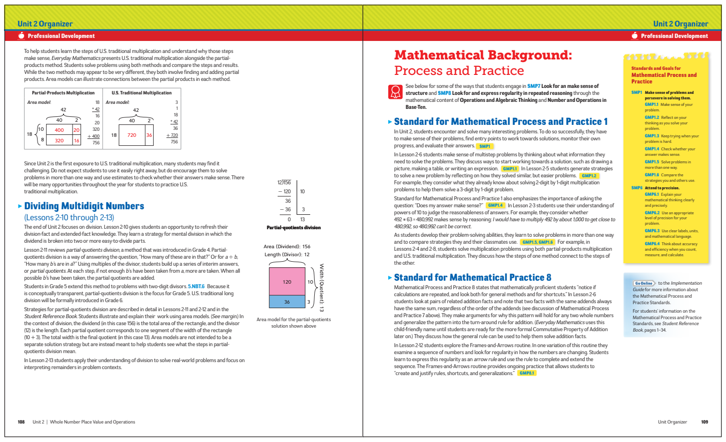
100 Unit 2 | Whole Number Place Value and Operations

Red text = Game

Preparing

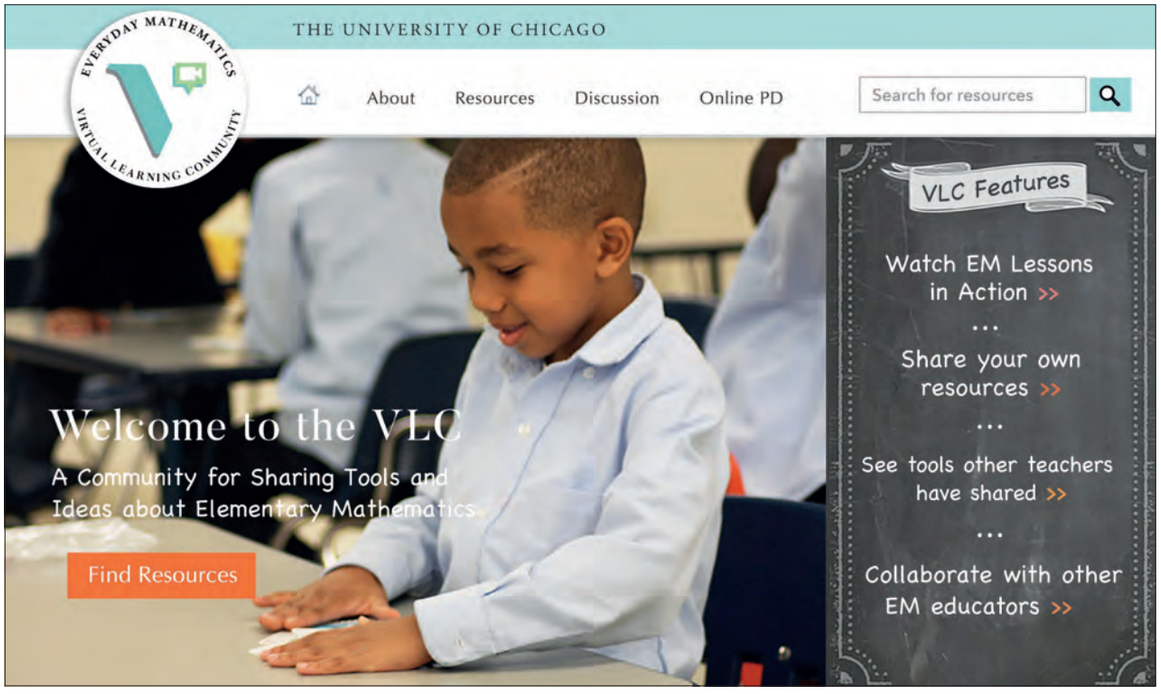
Every Unit Organizer also includes important background information on both content and practice standards to help you confidently deliver instruction.





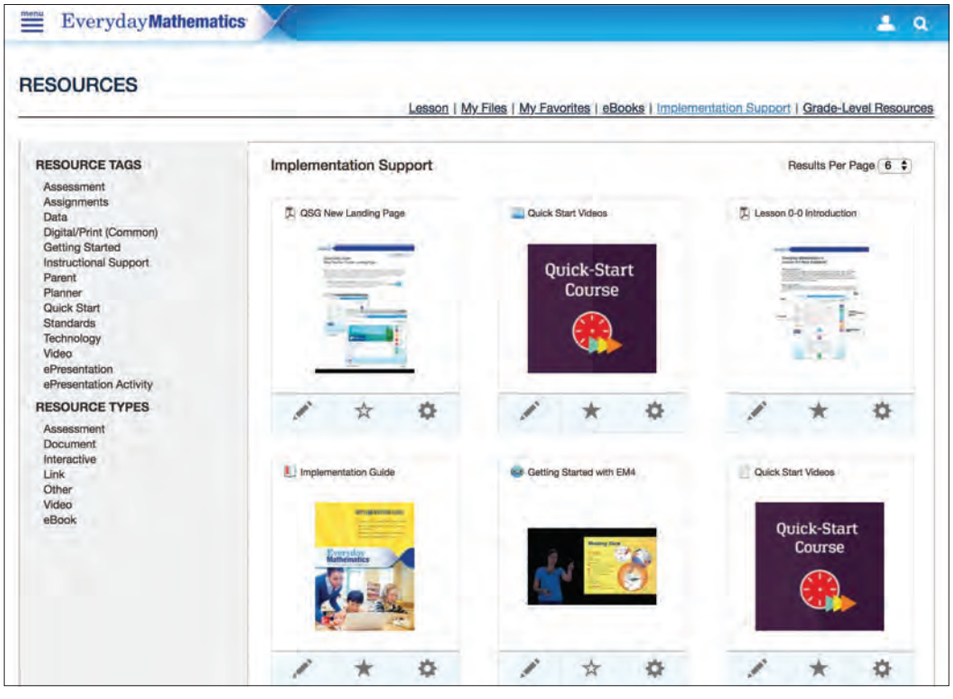
Support

The *Everyday Mathematics* Virtual Learning Community (VLC) at The University of Chicago, provides a free space where you can connect with a network of skilled, passionate educators who are also using the program, and interact with the authors. Resources on the VLC include classroom videos of lessons in action and instructional tools and resources.



Resources

Everything you need to successfully implement *Everyday Mathematics* is at your fingertips through the ConnectED Resource page of your Teacher Center including videos from the authors, quick start guides for key features, and the Implementation Guide, a comprehensive guide to using the program.



Getting Ready to Teach
Fifth Grade Everyday Mathematics

Welcome to *Fifth Grade Everyday Mathematics*. This guide introduces the organization and pedagogy of Everyday Mathematics and provides tips to help you start planning and teaching right away.

Grade 5 has **113 lessons** in 8 units. Plan to spend 60–75 minutes every day on math so that you complete **3–4 lessons each week** and one **unit every 4–5 weeks**.

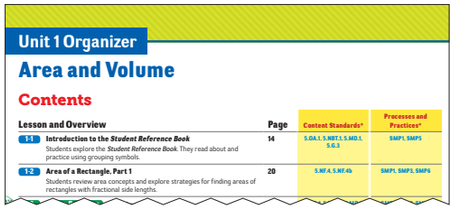
This pacing is designed for flexibility and depth. You will have flexibility so you can extend a lesson if discussion has been rich or if students' understandings are incomplete. You can add a day for "journal fix-up" or for differentiation—to provide an Enrichment activity to every student, for example—or for games. There will also be time to accommodate outside mandates, district initiatives, and special projects.

This pacing also gives you time to go deep, to create a classroom culture that values and supports productive struggle. You can expect your students to do their own thinking, to solve problems they have not been shown how to solve, to make connections between concepts and procedures, to explain their thinking, and to understand others' thinking. Creating such a classroom culture takes time, but it's what the Common Core asks you to do in its Standards for Mathematical Practice—and the pacing of *Everyday Mathematics 4* is designed to give you the time you'll need.

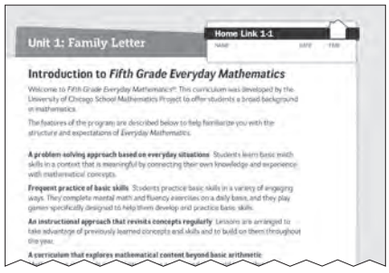
The *Teacher's Lesson Guide* is your primary source for information on planning units and teaching lessons. In most lessons, students will complete pages in their *Math Journals* or digitally in the Student Learning Center. Additional pages that require copies are available as *Math Masters*. See the Materials section on pages xxvi-xxvii for information on the teacher and student components.

Preparing for the Beginning of School

- Use the list on pages xxvi-xxvii to check that your **Classroom Resource Package** is complete.
- See page xxix for manipulatives and supplies you will need.
- Read the **Unit 1 Organizer** (pages 2–13) and the **first several lessons in Unit 1** to help you plan for the first week of school.
- Read the *Everyday Mathematics* in Grades 1–6 section of the ***Implementation Guide*** for more information on getting started.
- Prepare the **Unit 1 Family Letter** on *Math Masters*, pages 2–5 to distribute early in the school year.
- Review the **Beginning-of-Year Assessment** on pages 83–87 in the *Assessment Handbook* and consider when you will administer it.


Unit 1 Organizer
Area and Volume
Contents
Lesson and Overview | Page | Content Standards* | Processes and Practices*
1 1 Introduction to the *Student Reference Book* — Students explore the *Student Reference Book*. They read about and practice using grouping symbols. | 14 | 5.OA.1, 5.NBT.1, 5.MD.1, 5.G.3 | SMP1, SMP5
1 2 Area of a Rectangle, Part 1 — Students review area concepts and explore strategies for finding areas of rectangles with fractional side lengths. | 20 | 5.NF.4, 5.NF.4b | SMP1, SMP3, SMP6

Unit 1 begins on page 2.


Unit 1: Family Letter
Home Link 1-1
Introduction to *Fifth Grade Everyday Mathematics*

Go Online to join the Virtual Learning Community (VLC) to learn about *Everyday Mathematics* classrooms from other teachers and to find tips for setting up your classroom.

Lesson Types

Fifth Grade Everyday Mathematics includes three types of lessons, which share many of the same features.

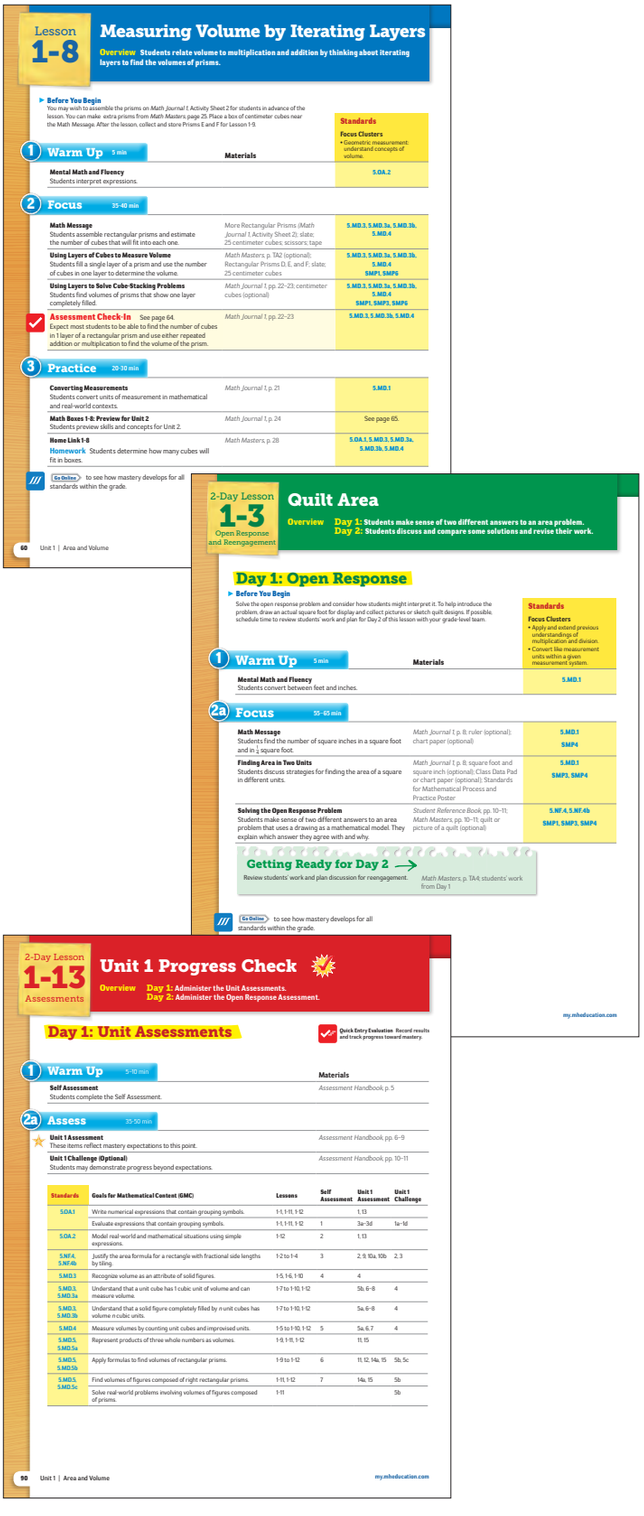
Regular Lessons are the most common lesson type. See the tables on the following pages for details about regular lessons.

Open Response and Reengagement Lessons extend over two days and occur in every unit. On Day 1 students solve a challenging problem that involves more than one possible strategy or solution. On Day 2 students reengage in the problem and are asked to defend their reasoning and make sense of the reasoning of other students.

Progress Check Lessons are two-day lessons at the end of every unit. All items on the Progress Check match expectations for progress at that point in the year, and with the exception of the optional challenge assessment, are fair to grade. On Day 1 students complete a self-assessment, a unit assessment,and an optional challenge assessment covering the content and practices that were the focus of the unit. Day 2 includes one of the following types of assessments:

- **Open Response Assessments** are included in odd-numbered units and allow students to think creatively about a problem. They address both content and process/practice standards and are accompanied by task-specific rubrics.

- **Cumulative Assessments** are included in even-numbered units and cover standards from prior units.



Lesson 1-8

Measuring Volume by Iterating Layers

Overview Students relate volume to multiplication and addition by thinking about iterating layers to find the volumes of prisms.

Before You Begin

You may wish to assemble the prisms on *Math Journal 1* Activity Sheet 2 for students in advance of the lesson. You can make extra prisms from *Math Masters*, page 25. Place a box of centimeter cubes near the Math Message. After the lesson, collect and store Prisms E and F for Lesson 1-9.

Standards

Focus Clusters

- Geometric measurement: understand concepts of volume.

1 Warm Up 5 min

Materials

Mental Math and Fluency
Students interpret expressions.
5.OA.2

2 Focus 35–40 min

Math Message
Students assemble rectangular prisms and estimate the number of cubes that will fit into each one.
More Rectangular Prisms (*Math Journal 1* Activity Sheet 2); slate; 25 centimeter cubes; scissors; tape
5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4

Using Layers of Cubes to Measure Volume
Students fill a single layer of a prism and use the number of cubes in one layer to determine the volume.
Math Masters, p. TA2 (optional); Rectangular Prisms D, E, and F; slate; 25 centimeter cubes
5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4
SMP1, SMP6

Using Layers to Solve Cube-Stacking Problems
Students find volumes of prisms that show one layer completely filled.
Math Journal 1, pp. 22–23; centimeter cubes (optional)
5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4
SMP1, SMP3, SMP6

Assessment Check-In See page 64.
Expect most students to be able to find the number of cubes in 1 layer of a rectangular prism and use either repeated addition or multiplication to find the volume of the prism.
Math Journal 1, pp. 22–23
5.MD.3, 5.MD.3b, 5.MD.4

3 Practice 20–30 min

Converting Measurements
Students convert units of measurement in mathematical and real-world contexts.
Math Journal 1, p. 21
5.MD.1

Math Boxes 1-8: Preview for Unit 2
Students preview skills and concepts for Unit 2.
Math Journal 1, p. 24
See page 65.

Home Link 1-8
Homework Students determine how many cubes will fit in boxes.
Math Masters, p. 28
5.OA.1, 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4

Go Online to see how mastery develops for all standards within the grade.

60 Unit 1 | Area and Volume

2-Day Lesson 1-3 Open Response and Reengagement

Quilt Area

Overview Day 1: Students make sense of two different answers to an area problem. Day 2: Students discuss and compare some solutions and revise their work.

Day 1: Open Response

Before You Begin

Solve the open response problem and consider how students might interpret it. To help introduce the problem, draw an actual square foot for display and collect pictures or sketch quilt designs. If possible, schedule time to review students' work and plan for Day 2 of this lesson with your grade-level team.

Standards

Focus Clusters

- Apply and extend previous understandings of multiplication and division.
- Convert like measurement units within a given measurement system.

1 Warm Up 5 min

Materials

Mental Math and Fluency
Students convert between feet and inches.
5.MD.1

2a Focus 50–65 min

Math Message
Students find the number of square inches in a square foot and in $\frac{1}{2}$ square foot.
Math Journal 1, p. 8; ruler (optional); chart paper (optional)
5.MD.1
SMP4

Finding Area in Two Units
Students discuss strategies for finding the area of a square in different units.
Math Journal 1, p. 8; square foot and square inch (optional); Class Data Pad or chart paper (optional); Standards for Mathematical Process and Practice Poster
5.MD.1
SMP3, SMP4

Solving the Open Response Problem
Students make sense of two different answers to an area problem that uses a drawing as a mathematical model. They explain which answer they agree with and why.
Student Reference Book, pp. 10–11; *Math Masters*, pp. 10–11; quilt or picture of a quilt (optional)
5.NF.4, 5.NF.4b
SMP1, SMP3, SMP4

Getting Ready for Day 2
Review students' work and plan discussion for reengagement.
Math Masters, p. TA4; students' work from Day 1

Go Online to see how mastery develops for all standards within the grade.

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2-Day Lesson 1-13 Assessments

Unit 1 Progress Check

Overview Day 1: Administer the Unit Assessments. Day 2: Administer the Open Response Assessment.

Day 1: Unit Assessments

Quick Entry Evaluation Record results and track progress toward mastery.

1 Warm Up 5–10 min

Materials

Self Assessment
Students complete the Self Assessment.
Assessment Handbook, p. 5

2a Assess 35–50 min

Unit 1 Assessment
These items reflect mastery expectations to this point.
Assessment Handbook, pp. 6–9

Unit 1 Challenge (Optional)
Students may demonstrate progress beyond expectations.
Assessment Handbook, pp. 10–11

Standards	Goals for Mathematical Content (GMC)	Lessons	Self Assessment	Unit 1 Assessment	Unit 1 Challenge
5.OA.1	Write numerical expressions that contain grouping symbols.	1-1, 1-11, 1-12		1, 13	
	Evaluate expressions that contain grouping symbols.	1-1, 1-11, 1-12	1	3a–3d	1a–1d
5.OA.2	Model real-world and mathematical situations using simple expressions.	1-12	2	1, 13	
5.NF.4, 5.NF.4b	Justify the area formula for a rectangle with fractional side lengths by tiling.	1-2 to 1-4	3	2, 9, 10a, 10b	2, 3
5.MD.3	Recognize volume as an attribute of solid figures.	1-5, 1-6, 1-10	4	4	
5.MD.3, 5.MD.3a	Understand that a unit cube has 1 cubic unit of volume and can measure volume.	1-7 to 1-10, 1-12		5b, 6–8	4
5.MD.3, 5.MD.3b	Understand that a solid figure completely filled by n unit cubes has volume n cubic units.	1-7 to 1-10, 1-12		5a, 6–8	4
5.MD.4	Measure volumes by counting unit cubes and improvised units.	1-5 to 1-10, 1-12	5	5a, 6, 7	4
5.MD.5, 5.MD.5a	Represent products of three whole numbers as volumes.	1-9, 1-11, 1-12		11, 15	
5.MD.5, 5.MD.5b	Apply formulas to find volumes of rectangular prisms.	1-9 to 1-12	6	11, 12, 14a, 15	5b, 5c
5.MD.5, 5.MD.5c	Find volumes of figures composed of right rectangular prisms.	1-11, 1-12	7	14a, 15	5b
	Solve real-world problems involving volumes of figures composed of prisms.	1-11			5b

90 Unit 1 | Area and Volume

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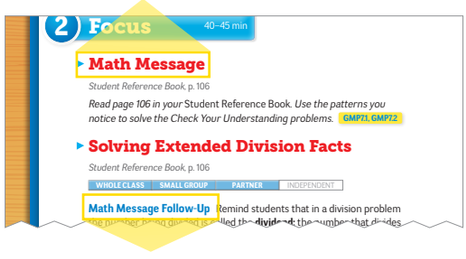
Lesson Parts and Features

Every lesson begins with two planning pages. The remaining pages provide a detailed guide for teaching the three parts of a lesson: Warm Up, Focus, and Practice.

Lesson Parts and Features		Description	Tips
Planning	**Lesson Opener**	An outline of the lesson to assist in your planning that includes information on content and standards, timing suggestions, assessment, and materials.	• See **Before You Begin** for preparation tips. • Follow the time allotments for each part of the lesson.
	Differentiation Options	Optional **Readiness**, **Enrichment**, **Extra Practice**, and **English Language Learners (ELL) Support** activities that allow you to differentiate instruction. Additional Differentiation Support pages are available online for each regular lesson.	• Choose to complete Differentiation Options as a whole class, with partners, as a small group, or individually depending on the needs of your students. • Note that some students may benefit from completing the **Readiness** activity prior to the lesson. Go Online to the *Implementation Guide* for information on differentiation.

Part 1: Warm Up		Description	Tips
Instruction	**Mental Math and Fluency**	Quick, leveled warm-up exercises students answer orally, with gestures, or on slates or tablets that provide practice towards fluency.	• Select the levels that make sense for your students and customize for your class. • Spend 5 or fewer minutes on this feature.

Part 2: Focus		Description	Tips
Instruction	**Math Message and Math Message Follow-Up**	An introductory activity to the day's lesson that usually requires students to solve a problem they have not been shown how to solve. The follow-up discussion connects to the focus activities of the lesson and gives students opportunities to discuss their strategies.	• Consider where and how you will display the Math Message and how students will record their answers.  • Maintain high cognitive demand by expecting students to work through the problem without your help before the follow-up discussion begins.

Part 2: Focus, con't.		Description	Tips
Instruction	**Focus Activities**	Two to four main instructional activities, including games, in which students explore and engage in new content (skills, concepts, games).	• Encourage students to discuss and work together to solve problems during focus activities. • Remember that many focus skills, concepts, applications, and games will be revisited in later practice. Go Online to the Spiral Tracker to see the complete spiral. • Look for Goals for Mathematical Process and Practice icons. GMP1.1 Use these to facilitate discussions about the processes and practices. Go Online to the *Implementation Guide* for information on Process and Practice Standards.
	Assessment Check-In ✓	A daily assessment opportunity to assess the focus content standards in the lesson. Assessment Check-Ins provide information on expectations for particular standards at that point in the curriculum.	• Use results to inform instruction. Expectation statements in the Assessment Check-Ins help you decide which students would benefit from differentiation activities. • Consider Assessment Check-Ins as "fair to grade" in most cases. Go Online to record students' progress and to see trajectories toward mastery for these and other standards. Go Online to the *Implementation Guide* for assessment information.

Part 3: Practice		Description	Tips
Instruction	**Practice Activity**	An opportunity to practice previously taught skills and content through a practice page or a game in many lessons.	• Allow time for practice pages and games because they are critical for students to meet expectations for standards. This is an essential part of the distributed practice in *Everyday Mathematics* • Plan for all students to play *Everyday Mathematics* games at least 60 minutes per week. Go Online to the *Implementation Guide* for tips to ensure that all students have ample game time. See also the Virtual Learning Community (VLC) to observe many *Everyday Mathematics* games in action.
	Math Boxes	A daily *Math Journal* page that reviews skills and concepts which students have seen prior to that point in the program. Preview Math Boxes anticipate content in the upcoming unit.	• Aim to have students complete Math Boxes with as little teacher support as possible. • Complete Math Boxes at any point during the day.
	Home Link	A daily homework page that provides practice and informs families about the math from that day's lesson.	Encourage students to do these activities with someone at home, such as a parent, caregiver, or sibling.

Differentiation and Language Features		Description and Purpose
Differentiation	**Adjusting the Activity**	Allows for differentiated instruction by offering modifications to lesson activities.
	Common Misconception	Offers point-of-use intervention tips that address common misconceptions.
	Game Modifications	Provides suggestions online for modifying games to support students who struggle and challenge students who are ready.
	Differentiation Support	Offers two online pages of specific differentiation ideas for each lesson, as well as ELL suggestions and scaffolding for students who need it.
Language Notes	**Academic Language Development**	Suggests how to introduce new academic vocabulary that is relevant to the lesson. These notes benefit all students, not solely English language learners.
	English Language Learners (ELL)	Provides activities and point-of-use ideas for supporting students at different levels of English language proficiency.

Getting to Know Your Classroom Resource Package

Complete access to all digital resources is included in your Classroom Resource Package.
To access these resources, log into **my.mheducation.com**.

Planning, Instruction, and Assessment

Resource	Description
***Teacher's Lesson Guide* (Volumes 1 and 2)** ☑ digital ☑ print	• Comprehensive guide to the *Everyday Mathematics* lessons and assessments • Standards alignment information: digital version includes online tracking of each content standard • Point-of-use differentiation strategies: Readiness, Enrichment, Extra Practice, English Language Learners support, Academic Language Development, Adjusting the Activity, Game Modifications, Common Misconceptions • Additional Differentiation Support pages available digitally for virtually every lesson • Unit overviews • Planning and calendar tools
eToolkit ☑ digital ☐ print	• Online tools and virtual manipulatives for dynamic instruction • A complete list of Grade 5 eTools on page xxix
ePresentations ☑ digital ☐ print	• Ready-made interactive white board lesson content to support daily instruction
Math Masters ☑ digital ☑ print	• Reproducible masters for lessons, Home Links, Family Letters, and games
Classroom Posters ☑ digital ☑ print	• Posters that display grade-specific mathematical content

Planning, Instruction, and Assessment (con't)

Resource	Description
Assessment Handbook ☑ digital ☑ print	• Assessment masters for unit-based assessments and interim assessments • Record sheets for tracking individual and class progress
Assessment and Reporting Tools ☑ digital ☐ print	• Student, class, school, and district reports • Data available at point-of-use in the planning and teaching materials • Real-time data to inform instruction and differentiation
Spiral Tracker ☑ digital ☐ print	• Online tool that helps you understand how standards develop across the spiral curriculum

Professional Development

Resource	Description
Implementation Guide ☑ digital ☐ print	• Online resource with information on implementing the curriculum
Virtual Learning Community ☑ digital ☐ print	• An online community, sponsored and facilitated by the Center for Elementary Mathematics and Science Education (CEMSE) at the University of Chicago, to network with other educators and share best practices • A collection of resources including videos of teachers implementing lessons in real classrooms, photos, work samples, and planning tools

Family Communications

Resource	Description
Home Connection Handbook ☑ digital ☐ print	• A collections of tips and tools to help you communicate to families about *Everyday Mathematics* • Reproducible masters for home communication for use by both teachers and administrators

Student Materials

Resource	Description
***Student Math Journal,* (Volumes 1 and 2)** ☑ digital ☑ print	• Student work pages that provide daily support for classroom instruction • Provide a long-term record of each student's mathematical development
Student Reference Book ☑ digital ☑ print	• Resource to support student learning in the classroom and at home • Includes explanations of mathematical content and directions for many *Everyday Mathematics* games
Activity Cards ☑ digital ☑ print	• Directions for students for Differentiation Options and other small-group activities
Student Learning Center ☑ digital ☐ print	• Combines *Student Math Journal, Student Reference Book,* eToolkit, and Activity Cards, and other resources for students in one location • Interactive functionality provides access in English and Spanish • Interactive functionality provides immediate feedback on select problems • Animations that can help with skills and concepts and reinforce classroom teaching • Provides access to EM Games Online and Facts Workshop Game
EM Games Online ☑ digital ☐ print	• Digital versions of many of the *Everyday Mathematics* games that provide important practice in a fun and engaging setting

Manipulative Kits and eToolkit

The table below lists the materials that are used on a regular basis throughout *Fifth Grade Everyday Mathematics*. All of the items below are available from McGraw-Hill Education. They may be purchased as a comprehensive classroom manipulatives kit or by individual items. The manipulative kit comes packaged in durable plastic tubs. Note that some lessons call for additional materials, which you or your children can bring in at the appropriate times. The additional materials are listed in the Unit Organizers and in the lessons in which they are used.

Manipulative Kit Contents		eTools
Item	Quantity	Item
Base-10 Big Cube	4 big cubes	✔
Base-10 Flats	3 packs of 10 flats	✔
Base-10 Longs	5 packs of 50 longs	✔
Base-10 Cubes	10 packs of 100 cubes	✔
Counters, Double-Sided	1 pack of 500	✔
Dice, Dot	2 packs of 12	✔
Everything Math Deck	15 decks	✔
Fraction Circle Pieces	25 sets	✔
Metersticks	2 packs of 6	
Number Line, −35 to 180	1 number line (in 3 parts)	✔
Pattern Blocks	1 set of 250	✔
Ruler, 12 in.	5 packs of 5 rulers	
Stopwatch	8 digital stopwatches	✔
Tape Measure, Retractable	15 tape measures	

Clear Pathway to Mastery

You can be confident your students are progressing toward mastery of every standard because *Everyday Mathematics* provides detailed information about the learning trajectories for each standard as well as expectations for mastery at every step of the way.

Unpack

Standards for Mathematical Content Strand Operations and Algebraic Thinking 5.OA	*Everyday Mathematics* Goals for Mathematical Content
Cluster Write and interpret numerical expressions.	
5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	GMC Write numerical expressions that contain grouping symbols. GMC Evaluate expressions that contain grouping symbols.
5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	GMC Model real-world and mathematical situations using simple expressions. GMC Interpret numerical expressions without evaluating them.
Cluster Analyze patterns and relationships.	
5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	GMC Generate numerical patterns using given rules. GMC Identify relationships between corresponding terms of two patterns. GMC Form ordered pairs from corresponding terms of patterns and graph them.

Goals for Mathematical Content

The *Everyday Mathematics* authors developed Goals for Mathematical Content (GMC) that break down each content standard to provide detailed information about the learning trajectories required to meet the full standard. See pages EM3–EM5 for a full view of the content standards and the related GMCs.

Goals for Mathematical Practice

The authors created Goals for Mathematical Practice (GMP) that unpack the practice standards, operationalizating them in ways that are appropriate for elementary students. See pages EM6–EM9 for a full view of the practice standards and the related GMPs.

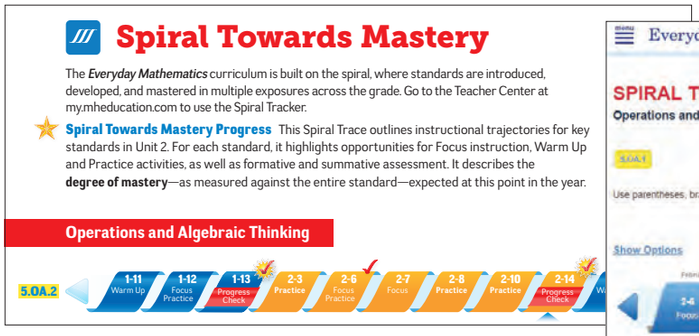
Standards for Mathematical Process and Practice	*Everyday Mathematics* Goals for Mathematical Process and Practice
1 Make sense of problems and persevere in solving them.	
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	GMP1.1 Make sense of your problem. GMP1.2 Reflect on your thinking as you solve your problem. GMP1.3 Keep trying when your problem is hard. GMP1.4 Check whether your answer makes sense. GMP1.5 Solve problems in more than one way. GMP1.6 Compare the strategies you and others use.
2 Reason abstractly and quantitatively.	
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to	GMP2.1 Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs, and concrete objects.

Track

Everyday Mathematics provides the tools you need to easily monitor your students' progress toward mastery.

Visible Learning Trajectories

Get a full picture of how each standard develops across a unit–and the entire grade.



Each unit organizer contains a view of the progression of the standards in the unit across recent and upcoming lessons.

Using the online Spiral Tracker you can see how each standard progresses across the grade.

Master

Unit organizers include mastery expectation statements that provide guidance about what you should expect your students to know by the end of the unit and to help you make decisions about differentiation and groupings.

Progress Towards Mastery By the end of Unit 2, expect students to write expressions to model situations which no more than two operations are involved; reason about the relative value of simple expressions without evaluating them.

Full Mastery of 5.OA.2 expected by the end of Unit 8.

The Mastery Expectations charts starting on page xl provide a full picture of how every standard develops across the entire grade.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.OA.1	Use one set of grouping symbols in an expression to model a real-world situation. Evaluate an expression that contains a single set of grouping symbols.	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Ongoing practice and application.	

Correlation to the Standards for Mathematics

Everyday Mathematics is a standards-based curriculum engineered to focus on specific mathematical content in every lesson and activity. The chart below shows complete coverage of each mathematics standard in the core program throughout the grade level.

*Bold lesson numbers indicate that content from the standard is taught in the Focus part of the lesson. Lesson numbers not in bold indicate that content from the standard is addressed in the Warm Up or Practice part of the lesson. The second set of lesson numbers, which are in parentheses, indicate that content from the standard is being addressed in Home Links or Math Boxes.

Content Standards for Mathematics for Grade 5	*Everyday Mathematics* Grade 5 Lessons*
Operations and Algebraic Thinking 5.OA	
Write and interpret numerical expressions.	
5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**1-1,** 1-5, 1-7, 1-9, **1-11,** 1-12, 2-3, 2-5, **2-6,** 2-8, 2-10, 3-6, **6-13** (1-2, 1-3, 1-4, 1-6, 1-8, 1-10, 2-1, 2-2, 2-4, 3-1, 3-2, 3-3, 3-4, 3-9, 3-10, 3-11, 3-12, 3-13, 3-14)
5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	1-1, 1-5, 1-8, 1-9, 1-11, **1-12,** 2-3, **2-6, 2-7,** 2-8, 2-10, 3-1, 3-3, 3-8, **3-11,** 4-3, 4-10, 4-13, **6-2, 6-8, 7-1** (1-2, 1-3, 1-4, 1-6, 1-7, 1-10, 2-2, 2-4, 3-2, 3-4, 3-9, 3-10, 3-13, 3-14)
Analyze patterns and relationships.	
5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	**4-9,** 5-6, **7-10, 7-11, 7-12, 7-13,** 8-2, **8-9** (6-10, 8-6, 8-10, 8-12)
Number and Operations in Base Ten 5.NBT	
Understand the place value system.	
5.NBT.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.	**1-1, 2-1, 2-2,** 2-4, 2-7, 2-10, 2-13, 3-9, 3-10, 3-14, **4-1, 4-2, 4-3, 4-4, 4-5,** 4-8, 4-9, 4-11, 5-4, 5-10, **6-1, 6-2,** 6-6, **6-12** (1-2, 1-4, 1-8, 2-3, 2-6, 2-8, 2-9, 2-11, 2-12, 3-1, 3-3, 3-5, 3-6, 3-8, 4-6, 4-13, 4-14, 5-6, 5-8, 6-3, 7-10)
5.NBT.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.	**2-2, 2-3,** 2-4, 2-5, 2-8, **2-9, 2-10,** 2-12, 2-13, 3-2, 3-5, 3-9, 3-10, 3-13, 4-9, **6-1, 6-2, 6-3,** 6-7, **6-9, 6-10,** 6-12, 7-2, 7-3, 7-5, 7-12, 8-1, 8-4, **8-7, 8-8,** 8-10, **8-11, 8-12** (1-8, 2-6, 2-7, 3-4, 3-7, 4-5, 4-12, 4-14, 5-10, 6-5, 6-6, 6-8, 6-11, 6-13, 7-1, 7-8, 8-2, 8-9)
5.NBT.3 Read, write, and compare decimals to thousandths.	**4-1, 4-2, 4-3, 4-4, 4-5,** 4-7, 4-8, **4-11,** 4-12, 4-13, 4-14, 5-1, 5-3, 5-4, 5-5, 5-8, 5-10, **6-1, 6-2,** 6-4, 6-6, 6-7, 6-11, **6-13,** 7-3, 8-1 (3-10, 4-6, 4-9, 5-2, 5-7, 5-11, 5-13, 6-3, 6-5, 6-8)

Content Standards for Mathematics for Grade 5	*Everyday Mathematics* Grade 5 Lessons*
5.NBT.3a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	**4-1, 4-2, 4-3, 4-4, 4-5,** 4-8, **4-11,** 4-12, 4-13, 4-14, 5-4, 5-5, 5-10, **6-1,** 6-2, 6-6, 6-11 (3-10, 4-6, 4-7, 4-9, 5-1, 5-2, 5-3, 5-7, 6-3, 6-8)
5.NBT.3b Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**4-4, 4-5,** 4-7, 4-8, 4-13, 5-1, 5-3, 5-4, 5-8, **6-2,** 6-4, 6-6, 6-7, **6-13,** 7-3, 8-1 (3-10, 4-9, 4-12, 4-14, 5-2, 5-5, 5-11, 5-13, 6-5)
5.NBT.4 Use place value understanding to round decimals to any place.	**4-5, 4-12, 4-13,** 4-14, 5-4, 5-6, 5-9, 6-11, **8-5, 8-11, 8-12** (3-10, 4-9, 4-11, 5-5, 5-7, 5-8, 6-2, 6-4)
Perform operations with multi-digit whole numbers and with decimals to hundredths.	
5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.	1-2, 1-7, **2-4, 2-5, 2-6, 2-7, 2-8, 2-9,** 3-1, 3-4, 4-7, 5-8, **6-9, 6-10, 8-1, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10** (1-8, 2-10, 2-11, 2-12, 2-13, 3-3, 3-5, 3-7, 3-8, 3-9, 3-11, 3-12, 3-13, 3-14, 4-1, 4-3, 4-5, 4-11, 4-13, 5-1, 5-2, 5-4, 5-5, 5-7)
5.NBT.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.	1-11, **2-10, 2-11, 2-12, 2-13,** 3-1, 3-2, **3-3, 3-5,** 3-6, 3-9, 3-12, 3-14, 4-4, 5-7, **6-5, 6-11, 6-12, 8-6, 8-7, 8-8, 8-10** (1-8, 3-4, 3-7, 3-8, 3-11, 3-13, 4-2, 4-5, 4-6, 4-7, 4-8, 4-14, 5-1, 5-2, 5-3, 5-5, 5-6, 5-8, 5-14, 6-1, 6-3, 6-8, 8-1)
5.NBT.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.	**4-11, 4-12, 4-13, 4-14,** 5-1, 5-3, 5-9, 5-12, 6-4, 6-6, **6-8, 6-9, 6-10, 6-11, 6-12, 6-13,** 7-4, 7-6, 7-7, 7-12, 7-13, **8-1,** 8-2, 8-3, 8-5, **8-6, 8-7, 8-8,** 8-9, **8-10** (5-2, 5-4, 5-5, 5-7, 5-8, 5-10, 5-11, 5-13, 5-14, 6-2, 7-1, 7-2, 7-3, 7-5, 7-8, 7-9, 7-10, 7-11, 8-4, 8-11, 8-12)
Number and Operations—Fractions 5.NF	
Use equivalent fractions as a strategy to add and subtract fractions.	
5.NF.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, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	1-2, 1-4**, 3-10, 3-11, 3-12,** 4-3, **5-1, 5-2, 5-3, 5-4,** 5-11, **6-4,** 6-7, **7-1,** 7-5, 7-6, **7-9, 8-2,** 8-8 (2-10, 3-13, 4-10, 4-11, 4-13, 5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-12, 5-13, 5-14, 6-1, 6-2, 6-3, 6-6, 6-8, 6-11, 6-13, 7-2, 7-3, 7-4, 7-8, 7-11, 7-13, 8-4)
5.NF.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.*	**3-4, 3-6, 3-7, 3-9, 3-10,** 3-11, **3-12,** 4-2, 4-8, **5-1, 5-3, 5-4,** 5-11, **6-4, 6-5,** 7-1, 7-6, **7-9,** 8-8 (2-10, 3-13, 3-14, 4-1, 4-3, 4-4, 4-5, 4-6, 4-7, 4-10, 5-6, 5-8, 5-9, 5-12, 5-14, 6-1, 6-3, 6-11, 7-11, 7-13)
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	
5.NF.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?*	**3-1, 3-2, 3-3, 3-4, 3-5,** 3-6, **3-8,** 3-11, **3-12,** 4-2, 4-4, 4-5, 4-9, 5-3, **5-6, 5-11, 5-13,** 6-5, **6-12, 7-2,** 7-4, 7-7 (2-10, 3-7, 4-1, 4-3, 4-6, 4-8, 4-10, 5-1, 5-5, 5-7, 5-10, 6-1, 6-10)
5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	**1-2, 1-3, 1-4,** 1-6, **3-13, 3-14,** 4-1, 4-6, 4-12, 4-14, **5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-11, 5-12,** 5-13, 5-14, 6-5, 6-6, 6-10, 6-13, **7-1, 7-2, 7-3,** 7-6, 7-7, **7-9,** 7-10, 7-12, **8-1, 8-2, 8-3,** 8-6, 8-9, 8-10 (1-5, 1-7, 1-9, 1-10, 1-11, 1-12, 2-1, 2-3, 2-10, 3-2, 3-4, 4-3, 4-9, 4-10, 6-1, 6-3, 6-7, 6-8, 6-9, 6-11, 6-12, 7-4, 7-5, 7-8, 7-11, 7-13, 8-4, 8-5, 8-7, 8-8, 8-11)

Content Standards for Mathematics for Grade 5	*Everyday Mathematics* Grade 5 Lessons*
5.NF.4a Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)*	**3-13, 3-14,** 4-1, 4-6, 4-12, **5-5, 5-6, 5-7, 5-8, 5-10, 5-12,** 5-13, 5-14, 6-5, 6-6, 6-10, 6-13, **7-1, 7-2,** 7-10 (4-3, 4-9, 4-10, 4-14, 5-9, 5-11, 6-1, 6-3, 6-8)
5.NF.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.	**1-2, 1-3, 1-4,** 1-6, 4-14, **5-7, 5-8, 5-9, 5-10, 5-12,** 6-5, **7-1, 7-2, 7-3,** 7-6, 7-7, **8-1, 8-2, 8-3,** 8-6, 8-9 (1-5, 1-7, 1-9, 1-10, 1-11, 1-12, 2-1, 2-3, 2-10, 3-2, 3-4, 4-10, 5-11, 5-13, 5-14, 6-7, 6-9, 6-10, 6-12, 7-5, 7-10, 7-13, 8-4, 8-5, 8-11)
5.NF.5 Interpret multiplication as scaling (resizing), by:	**4-8, 5-5, 5-6, 5-8, 5-9, 5-11, 5-12,** 5-14, **6-8, 7-1, 7-2, 7-4.** 7-8 (5-10, 5-13, 6-5, 6-7, 7-5, 7-7, 7-9, 7-12, 8-1, 8-3)
5.NF.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.	**4-8, 5-5, 5-6, 5-9, 5-11, 5-12,** 5-14, **6-8, 7-1, 7-2,** 7-8 (5-10, 5-13, 6-5, 6-7, 7-5, 7-7, 7-9, 7-12)
5.NF.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.	**5-5, 5-8, 5-9, 5-11, 5-12,** 5-14, **6-8, 7-2, 7-4**, 7-8 (6-5, 7-7, 7-9, 7-12, 8-1, 8-3)
5.NF.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.	**3-13, 3-14, 5-5, 5-6, 5-7, 5-9, 5-10, 5-12,** 6-5, 6-6, 6-10, **7-1, 7-2, 7-3,** 7-6, 7-7, 7-10, **8-1, 8-3,** 8-6, 8-9 (5-14, 6-8, 7-4, 7-8, 8-5, 8-7)
5.NF.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1]	**5-13, 5-14,** 6-2, **7-4,** 7-10, 8-7, 8-8 (6-4, 6-5, 6-7, 6-9, 6-10, 6-12, 7-1, 7-2, 7-3, 7-6, 7-7, 7-9, 7-11, 7-12, 7-13, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-9, 8-11, 8-12)
5.NF.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 $(1/12) \times 4 = 1/3$.*	**5-13,** 6-2, **7-4,** 7-10, 8-7, 8-8 (6-4, 6-9, 6-12, 7-2, 7-6, 7-13, 8-2, 8-4, 8-5, 8-6, 8-9, 8-11, 8-12)
5.NF.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 $20 \times (1/5) = 4$.*	**5-14,** 6-2, **7-4,** 7-10, 8-7 (6-5, 6-7, 6-10, 7-1, 7-2, 7-3, 7-7, 7-9, 7-11, 7-12, 8-1, 8-3, 8-5, 8-6, 8-9, 8-11, 8-12)
5.NF.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?*	**5-13, 5-14,** 6-2, **7-4,** 7-10, 8-8 (6-4, 7-1, 7-3, 8-1, 8-2, 8-3, 8-4, 8-9)
Measurement and Data 5.MD	
Convert like measurement units within a given measurement system.	
5.MD.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.	**1-1, 1-3,** 1-6, 1-8, **1-10, 1-11, 2-6,** 2-10, 4-4, 5-6, 5-13, **6-3, 6-4,** 7-3, **7-11, 8-1, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10** (1-2, 1-4, 1-12, 2-1, 2-3, 2-9, 2-12, 3-1, 3-3, 3-6, 3-8, 4-2, 5-2, 5-4, 7-10)

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

Content Standards for Mathematics for Grade 5	*Everyday Mathematics* Grade 5 Lessons*
Represent and interpret data.	
5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *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.*	**6-4, 6-5, 6-13,** 7-1, **7-9,** 8-8 (6-11, 7-6, 7-8, 8-2, 8-4)
Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.	
5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	**1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12,** 2-1, 2-6, 3-3, 3-13, 4-6, 4-13, **6-6, 6-7, 8-3, 8-4** (1-11, 2-3, 3-1, 7-10)
5.MD.3a 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.	**1-7, 1-8, 1-9, 1-10, 1-12,** 2-1, 2-6, 3-3, 4-13 (1-11, 2-3)
5.MD.3b 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.	**1-7, 1-8, 1-9, 1-10, 1-12,** 2-1, 2-6, 3-3, 4-13 (1-11, 2-3, 3-1)
5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	**1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12,** 2-1, 2-6, 3-3, 4-13, **6-7** (1-11, 2-3, 3-1)
5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	**1-9, 1-10, 1-11, 1-12,** 2-1, 2-2, 2-6, 3-3, 3-13, 4-6, 4-13, **6-6, 6-7, 8-3, 8-4** (2-4, 2-5, 2-7, 2-8, 2-9, 2-11, 2-12, 2-13, 3-5, 3-7, 3-11, 3-12, 4-2, 4-4, 4-8, 5-10)
5.MD.5a 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.	**1-9, 1-11, 1-12,** 2-1, 2-2, 2-6, 3-3, 3-13, 4-6, 4-13, **8-3** (2-4, 2-5, 2-7, 2-9, 2-12, 3-7, 4-2, 6-6)
5.MD.5b 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.	**1-9, 1-10, 1-11, 1-12,** 2-1, 2-2, 2-6, 3-3, 3-13, 4-6, 4-13, **6-6, 6-7, 8-3, 8-4** (2-4, 2-5, 2-7, 2-8, 2-9, 2-11, 2-12, 2-13, 3-5, 3-7, 3-11, 3-12, 4-2, 4-4, 5-10)
5.MD.5c 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.	**1-11, 1-12,** 2-2, 2-6, 3-3, 3-13, 4-6, 4-13, **6-6, 8-3** (2-8, 3-11, 3-12, 4-8, 5-10)
Geometry 5.G	
Graph points on the coordinate plane to solve real-world and mathematical problems.	
5.G.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).	**4-6, 4-7, 4-8, 4-9, 4-10,** 4-11, 5-2, 5-6, 5-13, 6-1, **7-10, 7-11, 7-12, 7-13,** 8-2, **8-10, 8-11, 8-12** (4-13, 5-1, 5-3, 5-11, 6-2, 6-4, 6-11, 6-13, 7-2, 7-4, 8-6)
5.G.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.	**4-7, 4-8, 4-9, 4-10,** 5-2, 5-6, 5-13, 6-1, **7-10, 7-11, 7-12, 7-13,** 8-2, **8-10, 8-11, 8-12** (3-10, 5-11, 6-2, 6-4, 6-11, 6-13, 7-2, 7-4, 8-6)
Classify two-dimensional figures into categories based on their properties.	
5.G.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.*	**1-1, 7-5, 7-6, 7-7, 7-8,** 7-9, 8-3, 8-8, 8-11, 8-12 (7-12, 8-6, 8-10)
5.G.4 Classify two-dimensional figures in a hierarchy based on properties.	**7-5, 7-6, 7-7, 7-8,** 7-9, 8-3, 8-8, 8-11, 8-12 (6-10, 8-10)

Correlation to the Mathematical Processes and Practices

Everyday Mathematics is a standards-based curriculum engineered to focus on specific mathematical content, processes, and practices in every lesson and activity. The chart below shows complete coverage of each mathematical process and practice in the core program throughout the grade level.

Mathematical Processes and Practices	*Everyday Mathematics* Goals for Mathematical Processes and Practices
1. Make sense of problems and persevere in solving them.	
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	**Pages** 17, 19, 22, 23, 25, 29, 31, 33, 47, 58, 59, 62, 64, 67, 115, 125, 127, 129, 130, 131, 132, 133, 136, 137, 139, 142, 143, 144, 145, 147, 148, 149, 155, 157, 158, 159, 161, 162, 163, 165, 168, 171, 175, 180, 181, 188, 191, 193, 194, 195, 197, 223, 231, 235, 236, 237, 245, 248, 249, 250, 251, 253, 257, 258, 259, 261, 263, 269, 271, 272, 275, 277, 278, 279, 283, 284, 287, 288, 289, 290, 293, 294, 295, 296, 297, 305, 308, 309, 343, 349, 351, 353, 354, 369, 391, 392, 393, 395, 396, 397, 407, 409, 410, 411, 413, 414, 415, 416, 417, 420, 421, 422, 445, 448, 449, 451, 455, 456, 459, 461, 462, 463, 465, 467, 468, 469, 477, 479, 480, 481, 484, 493, 501, 502, 503, 504, 506, 507, 515, 517, 518, 519, 520, 521, 523, 525, 526, 527, 529, 533, 555, 565, 567, 571, 572, 573, 588, 589, 590, 596, 601, 602, 603, 605, 608, 612, 613, 614, 615, 617, 618, 619, 621, 624, 625, 629, 635, 637, 665, 668, 669, 670, 673, 674, 675, 676, 679, 680, 681, 682, 683, 691, 705, 708, 710, 711, 713, 775, 776, 785, 786, 787, 788, 791, 792, 796, 797, 798, 799, 802, 803, 804, 805, 807, 809, 810, 811, 814, 815, 816, 817, 821, 822, 825, 828
2. Reason abstractly and quantitatively.	
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	**Pages** 19, 47, 55, 57, 59, 61, 67, 77, 79, 85, 87, 88, 114, 115, 145, 148, 149, 150, 151, 152, 159, 177, 180, 181, 182, 185, 187, 188, 219, 223, 233, 239, 241, 242, 243, 244, 245, 258, 259, 263, 264, 265, 275, 281, 291, 299, 300, 301, 302, 303, 305, 306, 307, 308, 316, 317, 331, 332, 333, 334, 335, 339, 340, 341, 342, 343, 345, 346, 347, 348, 349, 352, 353, 354, 355, 357, 358, 359, 360, 361, 363, 365, 366, 367, 368, 369, 371, 377, 383, 389, 390, 391, 392, 393, 395, 396, 397, 399, 400, 401, 402, 403, 404, 405, 446, 447, 459, 465, 471, 483, 489, 490, 491, 492, 493, 495, 496, 497, 498, 499, 501, 503, 504, 506, 507, 511, 520, 521, 523, 529, 555, 659, 660, 661, 662, 663, 665, 666, 667, 668, 671, 679, 685, 688, 689, 695, 698, 699, 701, 703, 704, 708, 709, 710, 711, 713, 714, 721, 723, 725, 726, 727, 729, 773, 775, 776, 777, 786, 787, 788, 789, 791, 792, 793, 837

Mathematical Processes and Practices	*Everyday Mathematics* Goals for Mathematical Processes and Practices
3. Construct viable arguments and critique the reasoning of others.	
Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	**Pages** 21, 23, 28, 29, 30, 31, 33, 34, 35, 44, 45, 46, 50, 52, 64, 67, 69, 70, 129, 220, 221, 222, 223, 225, 239, 257, 258, 259, 260, 261, 264, 265, 266, 267, 270, 271, 272, 273, 281, 299, 307, 308, 375, 379, 380, 413, 472, 474, 475, 477, 479, 480, 481, 497, 517, 530, 531, 532, 533, 600, 602, 621, 623, 624, 659, 679, 813, 825, 831, 832, 837, 838, 839
4. Model with mathematics.	
Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	**Pages** 27, 28, 29, 30, 31, 71, 79, 80, 81, 82, 83, 89, 121, 127, 143, 144, 161, 162, 165, 168, 175, 191, 193, 194, 195, 196, 197, 219, 220, 221, 222, 223, 225, 226, 227, 229, 231, 275, 276, 277, 278, 279, 295, 296, 297, 303, 343, 365, 369, 371, 372, 373, 383, 384, 385, 386, 387, 420, 421, 423, 469, 481, 485, 486, 489, 502, 503, 504, 506, 507, 508, 517, 519, 520, 521, 523, 524, 525, 526, 527, 530, 531, 532, 533, 539, 540, 561, 567, 575, 577, 578, 579, 581, 582, 584, 585, 587, 599, 612, 614, 615, 617, 618, 633, 635, 636, 637, 663, 674, 675, 676, 677, 717, 720, 721, 727, 729, 731, 732, 733, 735, 736, 737, 738, 739, 769, 770, 777, 779, 780, 781, 782, 783, 805, 808, 811, 817, 819, 821, 822, 825, 826, 827, 831, 834, 835, 837, 838, 839, 840, 841

Mathematical Processes and Practices	*Everyday Mathematics* Goals for Mathematical Processes and Practices
5. Use appropriate tools strategically.	
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.	**Pages** 15, 17, 18, 51, 52, 73, 143, 177, 242, 243, 244, 245, 270, 271, 275, 276, 277, 278, 279, 281, 282, 283, 284, 285, 291, 389, 390, 391, 392, 393, 395, 396, 397, 457, 593, 595, 596, 633, 634, 635, 636, 717
6. Attend to precision.	
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	**Pages** 15, 21, 23, 24, 25, 44, 50, 52, 57, 58, 61, 63, 64, 73, 74, 75, 76, 77, 83, 86, 87, 88, 96, 97, 117, 118, 119, 121, 123, 124, 125, 126, 127, 155, 158, 159, 162, 163, 165, 167, 168, 169, 174, 175, 177, 185, 186, 187, 188, 233, 234, 235, 236, 237, 239, 245, 257, 261, 283, 284, 301, 302, 333, 334, 335, 336, 337, 351, 355, 365, 368, 369, 372, 373, 374, 375, 377, 378, 379, 401, 402, 404, 407, 410, 411, 415, 416, 417, 421, 422, 423, 449, 457, 460, 461, 463, 465, 468, 471, 487, 491, 492, 493, 495, 499, 511, 512, 513, 514, 515, 517, 557, 558, 559, 561, 565, 566, 575, 577, 578, 589, 590, 591, 596, 597, 599, 611, 612, 613, 615, 617, 618, 619, 621, 624, 625, 627, 665, 691, 707, 708, 709, 710, 711, 713, 714, 717, 718, 719, 767, 769, 770, 771, 779, 780, 781, 782, 795, 797, 798, 799, 801, 805, 815, 816, 820, 821, 822, 823, 833, 834

Mathematical Processes and Practices	*Everyday Mathematics* Goals for Mathematical Processes and Practices
7. Look for and make use of structure.	
Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	**Pages** 39, 41, 69, 81, 83, 111, 112, 113, 114, 115, 117, 118, 119, 120, 121, 123, 129, 133, 137, 139, 141, 171, 172, 185, 189, 197, 219, 225, 227, 230, 247, 248, 249, 251, 253, 254, 257, 269, 273, 285, 299, 309, 331, 333, 337, 339, 351, 352, 353, 354, 357, 363, 381, 383, 384, 385, 386, 405, 445, 447, 448, 449, 451, 454, 456, 457, 459, 465, 472, 478, 479, 487, 493, 495, 511, 512, 513, 514, 515, 523, 529, 555, 558, 563, 564, 565, 566, 567, 569, 570, 571, 572, 573, 583, 584, 591, 605, 607, 608, 609, 628, 659, 661, 662, 673, 685, 686, 687, 689, 690, 691, 693, 694, 696, 697, 698, 699, 701, 702, 703, 704, 705, 707, 708, 709, 710, 711, 713, 714, 715, 721, 731, 732, 733, 739, 741, 742, 743, 744, 745, 751, 752, 767, 768, 769, 771, 783, 803, 805, 809, 811, 829, 841
8. Look for and express regularity in repeated reasoning.	
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process and practice, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	**Pages** 39, 69, 70, 135, 155, 227, 230, 231, 236, 247, 248, 249, 250, 251, 253, 254, 255, 257, 269, 273, 285, 339, 361, 362, 377, 380, 381, 387, 391, 393, 395, 396, 413, 472, 473, 495, 498, 511, 513, 514, 523, 558, 559, 560, 570, 571, 572, 573, 583, 601, 659, 681, 682, 703, 723, 724, 725, 726, 727, 729, 737, 738, 741, 742, 743, 744, 745, 777, 811

Mastery Expectations

In Fifth Grade, *Everyday Mathematics* focuses on procedures, concepts, and applications in three critical areas:

- Developing addition/subtraction fluency with fractions, and understanding of multiplication/division of fractions in limited cases.
- Developing fluency with decimal operations, extending division to 2-digit divisors, integrating decimals into the place-value system, and understanding operations with decimals to hundredths.
- Developing an understanding of volume.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.OA.1	Use one set of grouping symbols in an expression to model a real-world situation. Evaluate an expression that contains a single set of grouping symbols.	★ Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Ongoing practice and application.	
5.OA.2	Write simple expressions to model situations in which no more than two operations are involved. Reason about the relative value of simple expressions without evaluating them.	Write expressions using whole numbers and all four operations to model mathematical and real-world situations. Interpret numerical expressions involving whole numbers without evaluating them.	★ 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 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	Ongoing practice and application.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.OA.3	No expectations for mastery at this point.	Form ordered pairs from data represented in a table with reminders about the conventions of using parentheses to enclose the ordered pairs and commas to separate the numbers in an ordered pair. Graph ordered pairs on a coordinate grid.	Form ordered pairs from data represented in a table and graph them.	★ Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*
5.NBT.1	Use place-value understanding to write whole numbers in expanded form. Identify the values of digits in a given whole number. Write whole numbers in which digits represent given values. Recognize that in a multidigit whole number, a digit in one place represents 10 times what it represents in the place to its right.	Recognize that in multidigit whole numbers, a digit in one place represents 10 times what it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left. Recognize that place-value patterns in whole numbers extend to decimals.	★ 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.	Ongoing practice and application.

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NBT.2	Translate between powers of 10 in exponential notation and standard notation. Correctly multiply a whole number by a power of ten. Notice patterns in the number of zeros in a product when multiplying a whole number by a power of ten.	Use whole-number exponents to denote powers of 10. Correctly multiply whole numbers by powers of 10. Describe patterns in the number of zeros in a product when multiplying a whole number by a power of 10.	Use whole-number exponents to denote powers of 10. Multiply whole numbers by powers of 10 and explain the number of zeros in the product. Multiply or divide a decimal by a power of 10 when no more than one placeholder zero is necessary to write the product or quotient.	★ Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
5.NBT.3	No expectations for mastery at this point.	See the mastery expectation statements for the substandards (5.NBT.3a and 5.NBT.3b) for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.	★ Read, write, and compare decimals to thousandths.	Ongoing practice and application.
5.NBT.3a	No expectations for mastery at this point.	Represent decimals through thousandths by shading grids. Read and write decimals through thousandths with no placeholder zeros. Read and write decimals in expanded form as sums of decimals (e.g., 0.392 = 0.3 + 0.09 + 0.002).	★ Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	Ongoing practice and application.
5.NBT.3b	No expectations for mastery at this point.	Use grids or place-value charts to compare and order decimals through thousandths when the decimals have the same number of digits after the decimal point. Record comparisons using >, =, and < symbols.	★ Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Ongoing practice and application.
5.NBT.4	No expectations for mastery at this point.	Use grids, number lines, or a rounding shortcut to round decimals to the nearest tenth or hundredth in cases when rounding only affects one digit.	★ Use place value understanding to round decimals to any place.	Ongoing practice and application.

Image credits TK

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NBT.5	Use a strategy to multiply whole numbers. Understand the basic steps of the U.S. traditional multiplication algorithm and successfully apply it to 1-digit by multidigit problems and 2-digit by 2-digit problems in which one factor is less than 20.	Use the U.S. traditional multiplication algorithm to solve 2-digit by 2-digit multiplication problems. Use the U.S. traditional multiplication algorithm to solve multidigit by 2-digit multiplication problems in which only one digit in the second factor requires writing digits above the line. (For example, 636 * 17.)	★ Fluently multiply multi-digit whole numbers using the standard algorithm.	Ongoing practice and application.
5.NBT.6	Use the partial-quotients algorithm with up to 3-digit dividends and 1-digit or simple 2-digit divisors. Make connections between written partial-quotients work and a given area model representing the same solution.	Use the partial-quotients algorithm with up to 3-digit dividends and 1- or 2-digit divisors. Interpret the remainder of division problems in context, and explain the reasoning. Complete area models to represent solutions to division problems.	★ 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.	Ongoing practice and application.
5.NBT.7	No expectations for mastery at this point.	Use grids to add and subtract decimals. Use algorithms to add and subtract decimals through tenths with regrouping and through hundredths without regrouping.	Add and subtract decimals to hundredths using models or strategies. Estimate and find products of decimals when both factors are greater than 1. Estimate and find quotients of decimals when the dividend is greater than 1 and the divisor is a whole number.	★ 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.

Image credits TK

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NF.1	No expectations of mastery at this point.	Use tools or visual models to add fractions or mixed numbers with unlike denominators when only one fraction needs to be replaced with an equivalent fraction.	Use tools, visual models, or a strategy to find common denominators. Use tools, visual models, or a strategy to add fractions and mixed numbers with unlike denominators when a common denominator is not difficult to find. Use tools, visual models, or a strategy to subtract fractions and mixed numbers when one of the following is required, but not both: finding a common denominator, or renaming the starting number to have a larger fractional part.	★ Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
5.NF.2	No expectations of mastery at this point.	Use tools or visual models to solve number stories involving addition and subtraction of fractions and mixed numbers with like denominators.	Use tools, visual models, or equations to solve number stories involving addition and subtraction of fractions and mixed numbers with like denominators. Use tools, visual models, or a strategy to solve number stories involving addition of fractions and mixed numbers with unlike denominators when a common denominator is not difficult to find. Use tools, visual models, or a strategy to solve number stories involving subtraction of fractions and mixed numbers when one of the following is required, but not both: finding a common denominator, or renaming the starting number to have a larger fractional part.	★ 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.*

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NF.3	No expectations of mastery at this point.	Recognize that a fraction $\frac{a}{b}$ is the result of dividing a by b. Use tools and visual models to solve whole-number division number stories that have fraction or mixed-number answers. Rename mixed numbers and fractions greater than one.	★ 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?*	Ongoing practice and application.
5.NF.4	No expectations of mastery at this point.	Use tools and visual models to solve fraction-of problems involving a unit fraction and a whole-number.	Understand the relationship between fraction-of problems and fraction multiplication. Use tools and visual models to multiply a fraction by a whole number. Use tools and visual models to multiply a fraction by a fraction.	★ Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NF.4a	No expectations of mastery at this point.	Find a unit fraction of a whole number by partitioning the whole number into the appropriate number of parts and taking one of the parts. Recognize the relationship between the denominator of the unit fraction and the number of parts when partitioning the whole number.	Interpret $\left(\frac{1}{b}\right) \times q$ as 1 part of a partition of q into b equal parts. Find a fraction of a whole number, when the answer is a whole number, by partitioning the whole number into equal parts and taking the appropriate number of parts or by multiplying the whole number by the numerator of the fraction and dividing by the denominator of the fraction. Use paper-folding and other visual representations to partition a fraction into equal parts and find the value of one or more parts. Connect fraction-of problems to fraction multiplication.	★ Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*
5.NF.4b	Find the area of a rectangle with one fractional side length by tiling it with unit squares of side length 1 and counting full and partial squares. Understand that unit squares with fractional side lengths can be used to measure area, but that the count of unit squares with fractional side lengths is different from the measure of area in square units.	Find the area of a rectangle with one fractional side length by tiling it with unit squares of side length 1 and counting full and partial squares, or by using addition. (For example, find the area of a 4 by $2\frac{1}{2}$-unit rectangle by adding $2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2}$.) Understand that unit squares with fractional side lengths can be used to measure area, but that the count of unit squares with fractional side lengths is different from the measure of area in square units.	Find the area of a rectangle with fractional side lengths by counting the number of unit-fraction tiles that cover the rectangle and relating the count to how many tiles cover a unit square. Find the area of rectangles with two fractional side lengths using tools, models, or a fraction multiplication algorithm. Use area models to represent fraction products.	★ 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.5	No expectations of mastery at this point.	No expectations of mastery at this point.	See the mastery expectation statements for the substandards (5.NF.5a and 5.NF.5b) for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.	★ Interpret multiplication as scaling (resizing), by:

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NF.5a	No expectations of mastery at this point.	No expectations of mastery at this point.	Predict that a product of a whole number and a fraction less than 1 will be less than the whole number, without performing the indicated multiplication. Predict that the product of a whole number or a fraction multiplied by a fraction equal to 1 will be equal to the original whole number or fraction.	★ 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.5b	No expectations of mastery at this point.	No expectations of mastery at this point.	Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. Understand that multiplying a fraction by another fraction equal to 1 creates an equivalent fraction.	★ 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.6	No expectations for mastery at this point.	Use tools and visual models to solve real-world fraction-of problems with unit fractions and whole numbers.	Use tools and models to solve real-world problems involving multiplication of fractions by whole numbers or fractions by fractions. Represent fraction multiplication problems with number sentences.	★ 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.7	No expectations for mastery at this point.	No expectations for mastery at this point.	See the mastery expectation statements for the substandards (5.NF.7a, 5.NF.7b, and 5.NF.7c) for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.	★ Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.NF.7a	No expectations for mastery at this point.	No expectations for mastery at this point.	Use models to solve problems involving division of a unit fraction by a whole number when the problems are in context. Use fraction multiplication to check the quotient of a division problem involving division of a unit fraction by a whole number.	★ 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) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*
5.NF.7b	No expectations of mastery at this point.	No expectations for mastery at this point.	Use models to solve problems involving division of a whole number by a unit fraction when the problems are in context. Use fraction multiplication to check the quotient of a division problem involving division of a whole number by a unit fraction.	★ Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*
5.NF.7c	No expectation of mastery at this point.	No expectations for mastery at this point.	Use models to solve number stories involving division of a unit fraction by a whole number or division of a whole number by a unit fraction.	★ Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, 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?*
5.MD.1	Perform one-step unit conversions within the same measurement system. Use conversions to solve real-world problems when necessary conversions are identified.	Perform one-step and multi-step unit conversions within the same measurement system, using a resource as necessary to identify difficult measurement equivalents. Use conversions to solve multi-step, real-world problems when necessary conversions are identified.	Perform one-step and multi-step unit conversions within the same measurement system. Use conversions to solve multi-step, real-world problems, using a resource as necessary to identify difficult measurement equivalents.	★ 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.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.MD.2	No expectations for mastery at this point.	No expectations for mastery at this point.	Place fractional data on a line plot when the number line and scale are provided. Use information in line plots to solve single-step problems.	★ Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *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.3	Recognize volume as an attribute of open, three-dimensional figures. (Students may still demonstrate common misconceptions, such as believing that a book does not have volume because it cannot be packed with cubes.)	★ Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	Ongoing practice and application. →	
5.MD.3a	Understand that cubes are a good unit with which to measure volume because all the edge lengths of a cube are the same.	★ 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.	Ongoing practice and application. →	
5.MD.3b	Use unit cubes to pack a solid figure without gaps or overlaps.	★ 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.	Ongoing practice and application. →	
5.MD.4	Find the volume of fully-packed and partially-packed right rectangular prisms by counting unit cubes.	★ Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	Ongoing practice and application. →	

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.MD.5	See the mastery expectation statements for the substandards (5.MD.5a, 5.MD.5b, and 5.MD.5c) for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.	★ Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	Ongoing practice and application. →	
5.MD.5a	Understand that packing with unit cubes and multiplying dimensions are two strategies for finding the volume of a right rectangular prism. Use number sentences to represent the volume of a right rectangular prism, when given a formula and whole-number dimensions.	★ 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.	Ongoing practice and application. →	
5.MD.5b	Apply a volume formula to find the volume of a right rectangular prism in mathematical problems when given the formula and the dimensions of the prism.	★ 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.	Ongoing practice and application. →	
5.MD.5c	Find volumes of figures composed of right rectangular prisms, when given volume formulas and a clearly labeled representation.	★ 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.	Ongoing practice and application. →	

Standards	First Quarter Benchmark Expectations for Units 1 and 2	Second Quarter Benchmark Expectations for Units 3 and 4	Third Quarter Benchmark Expectations for Units 5 and 6	Fourth Quarter Benchmark Expectations for Units 7 and 8
5.G.1	No expectation of mastery at this point.	Understand that an ordered pair of numbers identifies an exact location on a coordinate grid. Use coordinates to graph points and to name graphed points in the first quadrant of the coordinate plane.	Make reasonable attempts to explain why an ordered pair of numbers identifies an exact location on a coordinate grid, using terms like origin, *x*-axis, *y*-axis, and coordinates. Use coordinates to graph points and to name graphed points in the first quadrant of the coordinate plane.	★ 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.2	No expectations for mastery at this point.	Understand that information from some real-world and mathematical problems can be represented as ordered pairs and graphed on a coordinate grid. Plot points to represent given information.	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane. Make reasonable attempts to interpret coordinate values of points in context.	★ 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.3	No expectations for mastery at this point.	No expectations for mastery at this point.	No expectations for mastery at this point.	★ 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.4	No expectations for mastery at this point.	No expectations for mastery at this point.	No expectations for mastery at this point.	★ Classify two-dimensional figures in a hierarchy based on properties.

Instruction concludes for this standard during this quarter (but the standard may be revisited for review, practice, or application to promote long-term retention, applications, generalization, and transfer).

★ Mastery expected during this quarter.

Contents

Focus

In Unit 1, students build on their prior work with area and explore ways to find the area of rectangles with fractional side lengths. Students also learn about volume.

Major Cluster

5.MD.C Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Supporting Cluster

5.OA.A Write and interpret numerical expressions.

5.MD.A Convert like measurement units within a given measurement system.

Focus

In Unit 2, students explore patterns in the base-10 place-value system and ways of representing large numbers. Students are also introduced to U.S. traditional multiplication and review partial-quotients division.

Major Clusters

5.NBT.A Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers with decimals to hundredths.

Supporting Cluster

5.MD.A Convert like measurement units within a given measurement system.

Unit 2 Whole Number Place Value and Operations 98

Focus

In Unit 3, students build on fractional concepts from previous grades to understand fractions as division. They also use visual models to make estimates, add and subtract fractions and mixed numbers, and check the reasonableness of their answers.

Major Clusters

5.NF.A Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.B Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Unit 3 Fraction Concepts, Addition, and Subtraction 206

Focus

In Unit 4, students read, write, and represent decimals through thousandths in a variety of ways and learn strategies to compare, order, and round decimals. They are also introduced to the first quadrant of the coordinate grid. Finally, they apply whole-number algorithms to add and subtract decimals.

Major Clusters

5.NBT.A Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.

Supporting Cluster

5.G.A Graph points on the coordinate plane to solve real-world and mathematical problems.

Unit 4 Decimal Concepts; Coordinate Grids 318

Focus

In Unit 5, students develop strategies for adding and subtracting fractions and mixed numbers with unlike denominators. They also connect fraction thinking to multiplication and generalize a fraction multiplication algorithm. Finally, students are introduced to fraction division.

Major Clusters

5.NF.A Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.B Apply and extend previous understandings of multiplication and division.

Unit 5 Operations with Fractions 432

Focus

In Unit 6, students multiply and divide decimals by powers of 10. They investigate how patterns can be used to convert measurements in metric units, learn how line plots can be used to organize and analyze data, and explore finding volumes of figures that are not rectangular prisms. Students also multiply and divide decimals.

Major Clusters

5.NBT.B Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.

Supporting Clusters

5.MD.B Represent and interpret data.

Unit 6 Investigations in Measurement; Decimal Multiplication and Division 542

Focus

In Unit 7, students learn two methods for multiplying mixed numbers. They review attributes of 2-dimensional figures and categorize shapes based on their properties. Finally, students graph points on coordinate grids to visualize numerical patterns and represent real-world problems.

Major Cluster

5.NF.A Apply and extend previous understandings of multiplication and division.

Supporting Clusters

5.OA.B Analyze patterns and relationships.

5.G.A Graph points on the coordinate plane to solve real-world and mathematical problems.

5.G.B Classify two-dimensional figures into categories based on their properties.

Focus

In Unit 8, students apply and extend many skills and concepts they have learned throughout the year to engaging, real-world problems.

Major Cluster

5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.

Supporting Clusters

5.MD.A Convert like measurement units within a given measurement system.

5.G.A Graph points on the coordinate plane to solve real-world mathematical problems.

Unit 2 Organizer

Whole Number Place Value and Operations

Contents

Lesson and Overview	Page	Content Standards*	Processes and Practices*
2-1 **Understanding Place Value** Students explore the multiplicative relationships between places in multidigit numbers.	110	5.NBT.1	SMP2, SMP7
2-2 **Exponents and Powers of 10** Students explain patterns in the number of zeros when multiplying by powers of 10. They use whole-number exponents to denote powers of 10.	116	5.NBT.1, 5.NBT.2	SMP6, SMP7
2-3 **Applying Powers of 10** Students estimate with powers of 10 to solve multiplication problems and check the reasonableness of products.	122	5.NBT.2	SMP1, SMP6
2-4 **U.S. Traditional Multiplication, Part 1** Students use U.S. traditional multiplication to multiply 2-digit numbers by 1-digit numbers.	128	5.NBT.5	SMP1
2-5 **U.S. Traditional Multiplication, Part 2** Students use U.S. traditional multiplication to multiply multidigit numbers by 1-digit numbers.	134	5.NBT.5	SMP1, SMP7
2-4 **Application: Unit Conversions** Students use unit conversions within the U.S. customary system to solve multistep problems.	140	5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1	SMP1, SMP4, SMP5
2-7 **U.S. Traditional Multiplication, Part 3** Students use U.S. traditional multiplication to multiply 2-digit numbers by 2-digit numbers.	146	5.OA.2, 5.NBT.5	SMP1, SMP2
2-8 **U.S. Traditional Multiplication, Part 4** Students use U.S. traditional multiplication to multiply multidigit numbers.	154	5.NBT.5	SMP1, SMP6
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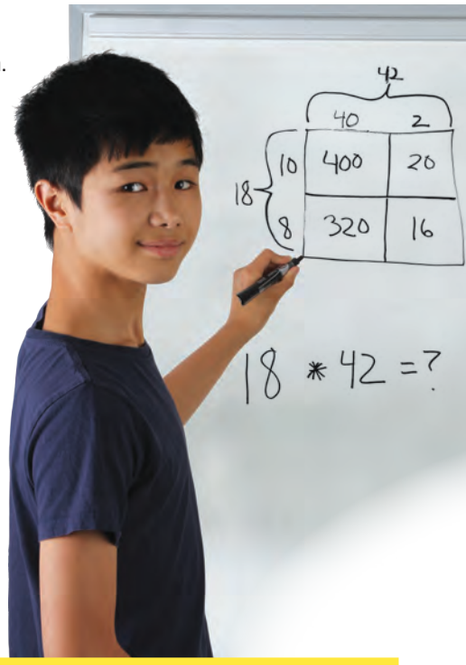
2-10 **A Mental Division Strategy** Students use the relationship between multiplication and division to mentally divide multidigit numbers.	170	5.NBT.2, 5.NBT.6	SMP6, SMP7
2-11 **Reviewing Partial-Quotients Division** Students review and practice strategies for using partial-quotients division to divide whole numbers.	176	5.NBT.6	SMP1, SMP2
2-12 **Strategies for Choosing Partial Quotients** Students use lists of multiples to find and choose partial quotients.	184	5.NBT.6	SMP1, SMP2, SMP6
2-13 **Interpreting the Remainder** Students solve division number stories and practice interpreting remainders.	190	5.NBT.6	SMP1, SMP4
2-Day Lesson 2-14 **Assessment** **Unit 2 Progress Check** **Day 1:** Administer the Unit Assessments. **Day 2:** Administer the Cumulative Assessment.	198		

*The standards listed here are addressed in the **Focus** of each lesson. For all the standards in a lesson, see the Lesson Opener.

Focus

In this unit, students explore patterns in the base-10 place-value system and ways of representing large numbers. Students are also introduced to U.S. traditional multiplication and review partial-quotients division.



Major Clusters

5.NBT.A Understand the place value system.

5.NBT.B Perform operations with multi-digit whole numbers with decimals to hundredths.

Supporting Cluster

5.MD.A Convert like measurement units within a given measurement system.

Process and Practice Standards

SMP1 Make sense of problems and persevere in solving them.

SMP6 Attend to precision.

Coherence

The table below describes how standards addressed in the Focus parts of the lessons link to the mathematics that students have done in the past and will do in the future.

	Links to the Past	Links to the Future
5.OA.1	In Unit 1, students reviewed how to use grouping symbols in expressions and how to evaluate expressions with grouping symbols. In Grade 3, students inserted parentheses in number sentences to make them true and evaluated number sentences with parentheses.	In Unit 7, students will use grouping symbols in an expression to model how to solve a multistep problem about gauging reaction time. In Grade 6, students will evaluate expressions and perform operations according to the Order of Operations.
5.OA.2	In Unit 1, students represented the volumes of rectangular prisms using expressions. They also wrote expressions to record calculations in the game *Name That Number*. In Grade 4, students represented problems using equations with a letter standing for an unknown quantity.	Throughout Grade 5, students will write expressions to record calculations in a variety of contexts. In Unit 6, they will order and interpret expressions without evaluating them. In Grade 6, students will write expressions in which letters stand for numbers.
5.NBT.1	In Grade 4, students worked with place-value concepts in whole numbers through 1,000,000.	In Unit 4, students will extend place-value concepts and patterns to decimals through thousandths. In Grade 6, students will extend their understanding of place value by applying their reasoning to make sense of decimal computation.
5.NBT.2	In Grade 4, students developed a rule for solving multiplication problems involving multiples of 10.	After students gain more experience with using exponents to denote powers of 10, they will multiply and divide decimals by powers of 10 and develop rules for doing so. In Unit 8, students will apply their knowledge of powers of 10 to solve rich, real-world problems. In Grade 6, students will write and evaluate numerical expressions with whole-number exponents.
5.NBT.5	In Grade 4, students used partial-products multiplication and lattice multiplication to solve multidigit multiplication problems.	Throughout Grade 5, students will use U.S. traditional multiplication to solve multiplication problems in mathematical and rich, real-world contexts. In Grade 6, students will use U.S. traditional multiplication to solve multidigit decimal multiplication problems.
5.NBT.6	In Grade 4, students used partial-quotients division to solve division problems with 4-digit dividends and 1-digit divisors.	Throughout Grade 5, students will use partial-quotients division to solve division problems in mathematical and rich, real-world contexts. In Grade 6, students will use the U.S. traditional division algorithm to solve division problems.
5.MD.1	In Unit 1, students converted between square units and cubic units. In Grade 4, students expressed measurement quantities in a larger unit in terms of a smaller unit.	In Unit 6, students will convert between metric units. In Units 7 and 8, students will use unit conversions to help them solve rich, real-world problems. In Grade 6, students will use ratio reasoning to convert measurement units.

Planning for Rich Math Instruction

		2-1 Understanding Place Value	2-2 Exponents and Powers of 10	2-3 Applying Powers of 10	2-4 U.S. Traditional Multiplication, Part 1
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Red text = Game

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	Differentiation Options, p. 135 ELL Support, p. 135 Online Differentiation Support 2-5 Academic Language Development, p. 136 Adjusting the Activity, p. 137 Common Misconception, p. 138	Differentiation Options, p. 141 ELL Support, p. 141 Online Differentiation Support 2-6 Academic Language Development, p. 143 Adjusting the Activity, p. 144	Differentiation Options, p. 147 ELL Support, p. 147 Online Differentiation Support 2-7 Adjusting the Activity, p. 149	Differentiation Options, p. 155 ELL Support, p. 155 Online Differentiation Support 2-8 Common Misconception, p. 157	**Differentiation Support**	

Planning for Rich Math Instruction

	2-9 Open Response **One Million Taps** 2-Day Lesson	2-10 **A Mental Division Strategy**	2-11 **Reviewing Partial-Quotients Division**	2-12 **Strategies for Choosing Partial Quotients**
RIGOR				
Conceptual Understanding	**Multiplying by powers of 10 in the context of calculating with efficiency** Discussing Efficient Strategies, p. 161	**Multidigit division** Using Multiples to Divide Mentally, p. 173	**Multidigit division** Reviewing Partial-Quotients Division, p. 178 Making Area Models, p. 180	**Multidigit division** Using Partial-Quotients Division with Lists of Multiples, p. 187
Procedural Skill and Fluency	Journal p. 59, #1, #2	Solving Extended Division Facts, p. 172 Using Multiples to Divide Mentally, p. 173 Introducing *Division Dash*, p. 174 Home Link 2-10, p. 175 Readiness, p. 171 Enrichment, p. 171 Extra Practice, p. 171	Mental Math and Fluency, p. 178 Estimating and Dividing, p. 181 Home Link 2-11, p. 183 Extra Practice, p. 177	Choosing Partial Quotients, p. 186 Using Partial-Quotients Division with Lists of Multiples, p. 187 Home Link 2-12, p. 189 Readiness, p. 185 Enrichment, p. 185 Extra Practice, p. 185
Applications	Math Message, p. 161 Solving the Open Response Problem, p. 163 Home Link 2-9, p. 169	Practicing Unit Conversions, p. 175	Math Message, p. 178	Journal p. 66, #1 Enrichment, p. 185
Rich Tasks and Mathematical Reasoning	Solving the Open Response Problem, p. 163 Reengaging in the Problem, p. 168 Revising Work, p. 168	Using Multiples to Divide Mentally, p. 173 Enrichment, p. 171	Estimating and Dividing, p. 181	Enrichment, p. 185
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Differentiation Support	ELL Support, p. 162 Adjusting the Activity, pp. 163, 168	Differentiation Support, p. 171 ELL Support, p. 171 Online Differentiation Support 2-10 Adjusting the Activity, pp. 172, 174	Differentiation Support, p. 177 ELL Support, p. 177 Online Differentiation Support 2-11 Adjusting the Activity, p. 179	Differentiation Support, p. 185 ELL Support, p. 185 Online Differentiation Support 2-12 Adjusting the Activity, p. 186

Red text = Game

Notes

2-13 Interpreting the Remainder

Interpreting division contexts

Modeling a Division Problem, pp. 192–194

Mental Math and Fluency, p. 192

Interpreting Remainders, pp. 194–196

Home Link 2-13, p. 197

Enrichment, p. 191

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Modeling a Division Problem, pp. 192–194

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Differentiation Options, p. 191

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2-14 Assessment Unit 2 Progress Check

Lesson 2-14 is an assessment lesson. It includes:

- **Self Assessment**
- **Unit Assessment**
- **Optional Challenge Assessment**
- **Cumulative Assessment**
- **Suggestions for adjusting the assessments.**

Go Online:

Evaluation Quick Entry Use this tool to record students' performance on assessment tasks.

Data Use the Data Dashboard to view students' progress reports.

Unit 2 Materials

Lesson	*Math Masters*	Activity Cards	Manipulative Kit	Other Materials
2-1	pp. 43–44; TA5; per partnership: G7–G9	15	base-10 blocks; number cards 1–9 (1 of each); per partnership: number cards 0–9 (4 of each)	calculator
2-2	pp. per partnership: 45–46; 47; per partnership: G10; G11	16	per partnership: two 6-sided dice	slate; scissors; per group: calculator (optional)
2-3	pp. 48–49; TA5 (optional); TA6	17	number cards 1–10 (1 of each); per partnership: number cards 0–9 (4 of each)	slate; per partnership: poster paper
2-4	pp. 50–51; TA7 (optional); per partnership: G7–G9	18	per partnership: number cards 0–9 (4 of each)	slate; calculator
2-5	pp. 52–54; TA6; per group: G3	19	per partnership: number cards 0–9 (4 of each); per group: number cards 1–10 (4 of each); 4 counters	per group: calculator or multiplication/division facts table
2-6	pp. 55; TA2 (optional); per partnership: G4–G5 (optional), G6	20–21	number cards 1–20 (1 of each); two 6-sided dice; per group: three 12-inch rulers, 36 square pattern blocks	per partnership: *Prism Pile-Up* cards, calculator (optional)
2-7	pp. 56–59; G12		per partnership: number cards 0–9 (4 of each), 6-sided die	slate
2-8	pp. 60; per partnership: G2	22	per partnership: number cards 0–10 (4 of each) and number cards 11–20 (1 of each)	per group: poster paper, crayons or markers
2-9	pp. 61–64; TA4		per partnership: stopwatch (optional)	slate; Guidelines for Discussion Poster; colored pencils (optional); selected samples of students' work; students' work from Day 1
2-10	pp. 65; per partnership: TA8; G13	23–24	per partnership: number cards 1–9 (4 of each), number cards 10–20 (1 of each), two 6-sided dice, 40 counters	slate
2-11	pp. 66; TA7 (optional); TA9	25	per partnership: number cards 0–9 (4 of each), tape measure	calculator (optional)
2-12	pp. 67–69; TA7 (optional); TA9–TA10; per partnership: G11	26	number cards 10–20 (1 of each); per partnership: two 6-sided dice	slate; calculator (optional)
2-13	pp. 70–72; TA7 (optional); TA10 (optional); TA11; per partnership: G10	27	6-sided die	
2-14	pp. 73–76; *Assessment Handbook*, pp. 14–22			

Literature Link Optional Books: 2-3 *Two of Everything: A Chinese Folktale* 2-9 *One Odd Day; My Even Day*

Go Online for a complete literature list for Grade 2 and to download all Quick Look Cards.

Assessment Check-In

These ongoing assessments offer an opportunity to gauge students' performance on one or more of the standards addressed in that lesson.

Evaluation Quick Entry Record students' performance online.

Data View reports online to see students' progress towards mastery.

Lesson	Task Description	Content Standards	Process and Practice
2-1	Write numbers in expanded form and identify values of digits.	5.NBT.1	SMP7
2-2	Multiply whole numbers by powers of ten and write the product in standard notation.	5.NBT.2	
2-3	Use powers of 10 to estimate products and explain reasoning.	5.NBT.2	SMP6
2-4	Multiply 2-digit numbers by 1-digit numbers using U.S. traditional multiplication and other strategies.	5.NBT.5	SMP1
2-5	Multiply multidigit numbers by 1-digit numbers using U.S. traditional multiplication.	5.NBT.5	
2-6	Solve number stories involving U.S. customary unit conversions and write expressions to model problems.	5.OA.2, 5.MD.1	SMP4
2-7	Multiply two 2-digit numbers using U.S. traditional multiplication.	5.NBT.5	
2-8	Multiply multidigit numbers using U.S. traditional multiplication.	5.NBT.5	
2-9	Use patterns of powers of 10 to calculate an estimate.	5.NBT.2	SMP6
2-10	Divide multidigit numbers using informal strategies.	5.NBT.6	SMP6
2-11	Use partial-quotients division to solve problems with 3-digit and 4-digit dividends.	5.NBT.6	SMP2
2-12	Use partial-quotients division to solve problems with 4-digit dividends.	5.NBT.6	
2-13	Create mathematical models to solve division problems and interpret remainders.	5.NBT.6	SMP4

Virtual Learning Community

vlc.uchicago.edu

UCHICAGO STEM EDUCATION

While planning your instruction for this unit, visit the *Everyday Mathematics* Virtual Learning Community. You can view videos of lessons in this unit, search for instructional resources shared by teachers, and ask questions of *Everyday Mathematics* authors and other educators. Some of the resources on the VLC related to this unit include:

EM4: Grade 5 Unit 2 Planning Webinar
This webinar provides a preview of the lessons and content in this unit. Watch this video with your grade-level colleagues and plan together under the guidance of an *Everyday Mathematics* author.

Choosing Multiplication Strategies
Watch students solve a multiplication problem in two ways and discuss what they like and dislike about each method. The teacher concludes the discussion by pointing out a third method that also works.

Lesson Opening Routines with *Multiplication Bull's Eye*
Watch a class efficiently work through the lesson opening routines: Mental Math and Fluency, Math Message with Follow-Up. Then watch students playing one round of *Multiplication Bull's Eye*.

For more resources, go to the VLC Resources page and search for Grade 5.

Spiral Towards Mastery

The *Everyday Mathematics* curriculum is built on the spiral, where standards are introduced, developed, and mastered in multiple exposures across the grade. Go to the Teacher Center at my.mheducation.com to use the Spiral Tracker.

Spiral Towards Mastery Progress This Spiral Trace outlines instructional trajectories for key standards in Unit 2. For each standard, it highlights opportunities for Focus instruction, Warm Up and Practice activities, as well as formative and summative assessment. It describes the **degree of mastery**—as measured against the entire standard—expected at this point in the year.

Operations and Algebraic Thinking

Progress Towards Mastery By the end of Unit 2, expect students to write expressions to model situations which no more than two operations are involved; reason about the relative value of simple expressions without evaluating them.

Full Mastery of 5.OA.2 expected by the end of Unit 8.

Number and Operations in Base Ten

Progress Towards Mastery By the end of Unit 2, expect students to use place-value understanding to write whole numbers in expanded form; identify the values of digits in a given whole number; write whole numbers in which digits represent given values; recognize that in a multidigit whole number, a digit in one place represents 10 time what it represents in the place to its right.

Full Mastery of 5.NBT.1 expected by the end of Unit 9.

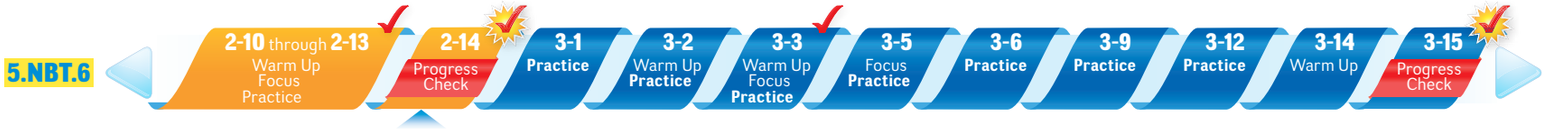
Progress Towards Mastery By the end of Unit 2, expect students to translate between powers of 10 in exponential notation and standard notation; correctly multiply a whole number by a power of 10; notice patterns in the number of zeros in a product when multiplying a whole number by a power of 10.

Full Mastery of 5.NBT.2 expected by the end of Unit 4.

Key ✓ = Assessment Check-In = Progress Check Lesson = Current Unit = Previous or Upcoming Lessons

Progress Towards Mastery By the end of Unit 2, expect students to use a strategy to multiply whole numbers; understand the basic steps of the U.S. traditional multiplication algorithm and successfully apply it to 1-digit by multidigit problems and 2-digit by s-digit problems in which one factor is less than 20.

Full Mastery of 5.NBT.5 expected by the end of Unit 7.



Progress Towards Mastery By the end of Unit 2, expect students to use partial-quotient algorithm with up to 3-digit dividends and 1-digit or simple 2-digit divisors; make connections between written partial-quotients work and a given area model representing the same solution.

Full Mastery of 5.NBT.6 expected by the end of Unit 5.

Measurement and Data

Progress Towards Mastery By the end of Unit 2, expect students to perform on-step unit conversions within the same measurement system; use conversions to solve real-problems when necessary conversions are identified.

Full Mastery of 5.MD.1 expected by the end of Unit 6.

Key ✓ = Assessment Check-In = Progress Check Lesson = Current Unit = Previous or Upcoming Lessons

Mathematical Background: Content

Place-Value Patterns (Lessons 2-1 and 2-2)

We write numbers using a base-10 place-value system in which the value of a digit depends on its place in a number. In base 10, the value of each digit is 10 times what it would be in the place to its right. 5.NBT.1 For example, a 2 in the ones place, as in 72, is worth just 2, but a 2 in the tens place, as in 23, is worth 10 times as much, or 20. A 2 in the hundreds place, as in 230, is worth another 10 times as much, or 200, and so on. *(See margin.)*

In earlier grades, students represented multidigit numbers using *expanded form,* in which a number is written as the sum of the values of each digit. Students continue to use expanded form in Grade 5. Different versions of expanded form illuminate important aspects of the place-value system. For example, each of the following is a version of expanded form for 65,682:

- 60,000 + 5,000 + 600 + 80 + 2
- 6 ten thousands + 5 thousands + 6 hundreds + 8 tens + 2 ones
- (6 * 10,000) + (5 * 1,000) + (6 * 100) + (8 * 10) + (2 * 1)

In the first expression, it is not immediately obvious how the value of a digit in the ones place relates to the value of a digit in the tens place. However, with the digit separated from its place in the other two expressions, as in 2 ones or (2 * 1), students can more easily recognize that *ten* is 10 times as much as *one*, so a digit in the tens place is worth 10 times as much as it would be in the ones place.

Students began to explore and describe this *10 times as much* pattern in Grade 4. In Grade 5, students also consider how the value of a digit relates to the place going in the other direction. They observe that if a digit moves one place to the *right*, its value is divided by 10. For example, the 2 in 27 is worth 20, but 2 in 72 is worth 20 ÷ 10, or 2. Students reason that dividing by 10, or dividing a value into 10 equal parts, is the same as taking $\frac{1}{10}$ of the value. They recognize that a digit in a given place represents $\frac{1}{10}$ of what it represents in the place to its left. 5.NBT.1 *(See margin.)* In later units, students will extend the *10 times as much* and $\frac{1}{10}$ *of* patterns to decimals.

Powers of 10 and Exponential Notation (Lessons 2-2 and 2-3)

In this unit, students are introduced to powers of 10 and exponential notation. *Powers of 10* are numbers that can be written as a product of 10s. For example, 1,000 is a power of 10 because it can be written as 10 * 10 * 10. *Exponential notation* is a way of representing repeated multiplication by the same factor. For example, 10^3 is exponential notation for 10 * 10 * 10, or 1,000. The *exponent,* 3, tells how many times the *base,* 10, is used as a factor. While any number can be used as a base, students in Grade 5 are only expected to use exponents to denote powers of 10. 5.NBT.2

Standards and Goals for Mathematical Content

Because the standards within each strand can be broad, *Everyday Mathematics* has unpacked each standard into Goals for Mathematical Content GMC. For a complete list of Standards and Goals, see page EM1.

10 * 10 * 10 *

1,000s Thousands	100s Hundreds	10s Tens	1s Ones
			2
		2	3
	2	3	0
2	3	0	0

A place-value chart showing the *10 times as much* relationship between places

$\frac{1}{10}$ * $\frac{1}{10}$ * $\frac{1}{10}$ *

1,000s Thousands	100s Hundreds	10s Tens	1s Ones
6	5	0	0
	6	5	0

A place-value chart showing the $\frac{1}{10}$ *of* relationship between places

Unit 2 Vocabulary

algorithm
area model
base
convert
dividend
divisor
efficient
estimate
expanded form
exponent
exponential notation
expression
extended multiplication fact
mathematical model
measurement units
multiple
number model
partial-products multiplication
partial quotient
partial-quotients division
place value
power of 10
quotient
relation symbol
remainder
standard notation
U.S. traditional multiplication

In Lesson 2-2 students look for patterns in powers of 10. They observe that the number of zeros in a power of 10 written in standard notation matches both the exponent in exponential notation and the number of times 10 is used as a factor. Students also learn that some numbers can be expressed as multiples of powers of 10. The number 65,000, for instance, can be represented as $65 * 1{,}000$, or $65 * 10^3$. Students connect this idea to expanded form. For example, they note that 3,745 can be expressed as $(3 * 10^3) + (7 * 10^2) + (4 * 10^1) + (5 * 10^0)$.

Students use powers of 10 to reason about *extended multiplication facts*, which are variations of basic facts involving multiples of 10, 100, and so on. In Lesson 2-3 students solve problems like $50 * 400$ by thinking: *I can rewrite $50 * 400$ as $5 * 10^1 * 4 * 10^2$. $5 * 4 = 20$. Multiplying by 10^1 means I attach one zero. Multiplying by 10^2 means I attach two zeros. That is three attached zeros, which gives 20,000.* Students discuss and generalize these patterns. **5.NBT.2**

NOTE To make the connection between powers of 10 in exponential notation and expanded form, students need to know that 1 can be represented as 10^0. This is true by definition, as any nonzero number to the zero power is defined as 1. Although this may seem counterintuitive, the definition preserves important properties of exponents. In Grade 5, students are not expected to understand the rationale behind the 10^0 definition.

▸ Understanding U.S. Traditional Multiplication

(Lessons 2-4 through 2-9)

Standards require students in Grade 5 to fluently multiply multidigit numbers using the standard algorithm. **5.NBT.5** In *Everyday Mathematics*, the standard algorithm is referred to as *U.S. traditional multiplication* to acknowledge that it is not standard in all parts of the world.

In Grade 4, students multiplied numbers using *partial-products multiplication*, a method based on place value and the Distributive Property. In partial-products multiplication, each factor is thought of as a sum of ones, tens, hundreds, and so on. Each part of one factor is multiplied by each part of the other factor, and all of the resulting *partial products* are added. (*See margin.*) This method helps students keep track of their work by separating the multiplication steps from the addition steps.

U.S. traditional multiplication compresses this process. Each digit of one factor is multiplied by each digit of the other factor, but the partial products are added mentally before being recorded. This means that multiplication steps alternate with addition steps, and the notation used to record steps makes it more difficult to see the values of digits. (*See margin.*) When students multiply 3 by the 5 in 752, it is not immediately apparent that students are multiplying 3 by 5 *tens* to get 150.

		7	5	2
	*			3
3 * 700 →	2	1	0	0
3 * 50 →		1	5	0
3 * 2 →	+			6
	2,	2	5	6

Partial-products multiplication

		1		
		7	5	2
	*			3
	2,	2	5	6

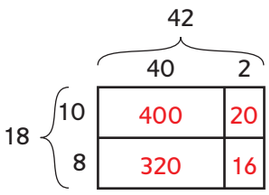
U.S. traditional multiplication

Professional Development

To help students learn the steps of U.S. traditional multiplication and understand why those steps make sense, *Everyday Mathematics* presents U.S. traditional multiplication alongside the partial-products method. Students solve problems using both methods and compare the steps and results. While the two methods may appear to be very different, they both involve finding and adding partial products. Area models can illustrate connections between the partial products in each method.

Partial-Products Multiplication

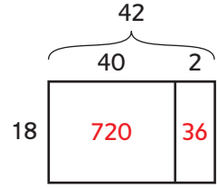
Area model:



18
* 42
16
20
320
+ 400
756

U.S. Traditional Multiplication

Area model:



3
1
18
* 42
36
+ 720
756

Since Unit 2 is the first exposure to U.S. traditional multiplication, many students may find it challenging. Do not expect students to use it easily right away, but do encourage them to solve problems in more than one way and use estimates to check whether their answers make sense. There will be many opportunities throughout the year for students to practice U.S. traditional multiplication.

Dividing Multidigit Numbers

(Lessons 2-10 through 2-13)

The end of Unit 2 focuses on division. Lesson 2-10 gives students an opportunity to refresh their division-fact and extended-fact knowledge. They learn a strategy for mental division in which the dividend is broken into two or more easy-to-divide parts.

Lesson 2-11 reviews *partial-quotients division,* a method that was introduced in Grade 4. Partial-quotients division is a way of answering the question, "How many of these are in that?" Or for $a \div b$, "How many b's are in a?" Using multiples of the divisor, students build up a series of interim answers, or *partial quotients.* At each step, if not enough b's have been taken from a, more are taken. When all possible b's have been taken, the partial quotients are added.

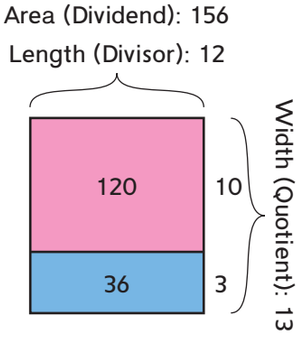
Students in Grade 5 extend this method to problems with two-digit divisors. **5.NBT.6** Because it is conceptually transparent, partial-quotients division is the focus for Grade 5. U.S. traditional long division will be formally introduced in Grade 6.

Strategies for partial-quotients division are described in detail in Lessons 2-11 and 2-12 and in the *Student Reference Book.* Students illustrate and explain their work using area models. (*See margin.*) In the context of division, the dividend (in this case 156) is the total area of the rectangle, and the divisor (12) is the length. Each partial quotient corresponds to one segment of the width of the rectangle (10 + 3). The total width is the final quotient (in this case 13). Area models are not intended to be a separate solution strategy but are instead meant to help students see what the steps in partial-quotients division mean.

In Lesson 2-13 students apply their understanding of division to solve real-world problems and focus on interpreting remainders in problem contexts.

12)156	
− 120	10
36	
− 36	3
0	13

Partial-quotients division



Area model for the partial-quotients solution shown above

Mathematical Background: Process and Practice

See below for some of the ways that students engage in **SMP7 Look for an make sense of structure** and **SMP8 Look for and express regularity in repeated reasoning** through the mathematical content of **Operations and Algebraic Thinking** and **Number and Operations in Base-Ten.**

Standard for Mathematical Process and Practice 1

In Unit 2, students encounter and solve many interesting problems. To do so successfully, they have to make sense of their problems, find entry points to work towards solutions, monitor their own progress, and evaluate their answers. **SMP1**

In Lesson 2-6 students make sense of multistep problems by thinking about what information they need to solve the problems. They discuss ways to start working towards a solution, such as drawing a picture, making a table, or writing an expression. **GMP1.1** In Lesson 2-5 students generate strategies to solve a new problem by reflecting on how they solved similar, but easier problems. **GMP1.2** For example, they consider what they already know about solving 2-digit by 1-digit multiplication problems to help them solve a 3-digit by 1-digit problem.

Standard for Mathematical Process and Practice 1 also emphasizes the importance of asking the question: "Does my answer make sense?" **GMP1.4** In Lesson 2-3 students use their understanding of powers of 10 to judge the reasonableness of answers. For example, they consider whether 492 * 63 = 480,992 makes sense by reasoning: *I would have to multiply 492 by about 1,000 to get close to 480,992, so 480,992 can't be correct.*

As students develop their problem-solving abilities, they learn to solve problems in more than one way and to compare strategies they and their classmates use. **GMP1.5, GMP1.6** For example, in Lessons 2-4 and 2-8, students solve multiplication problems using both partial-products multiplication and U.S. traditional multiplication. They discuss how the steps of one method connect to the steps of the other.

Standard for Mathematical Practice 8

Mathematical Process and Practice 8 states that mathematically proficient students "notice if calculations are repeated, and look both for general methods and for shortcuts." In Lesson 2-6 students look at pairs of related addition facts and note that two facts with the same addends always have the same sum, regardless of the order of the addends (see discussion of Mathematical Process and Practice 7 above). They make arguments for why this pattern will hold for any two whole numbers and generalize the pattern into the turn-around rule for addition. (*Everyday Mathematics* uses this child-friendly name until students are ready for the more formal Commutative Property of Addition later on.) They discuss how the general rule can be used to help them solve addition facts.

In Lesson 2-12 students explore the Frames-and-Arrows routine. In one variation of this routine they examine a sequence of numbers and look for regularity in how the numbers are changing. Students learn to express this regularity as an *arrow rule* and use the rule to complete and extend the sequence. The Frames-and-Arrows routine provides ongoing practice that allows students to "create and justify rules, shortcuts, and generalizations." **GMP8.1**

Standards and Goals for Mathematical Process and Practice

SMP1 Make sense of problems and persevere in solving them.

GMP1.1 Make sense of your problem.

GMP1.2 Reflect on your thinking as you solve your problem.

GMP1.3 Keep trying when your problem is hard.

GMP1.4 Check whether your answer makes sense.

GMP1.5 Solve problems in more than one way.

GMP1.6 Compare the strategies you and others use.

SMP6 Attend to precision.

GMP6.1 Explain your mathematical thinking clearly and precisely.

GMP6.2 Use an appropriate level of precision for your problem.

GMP6.3 Use clear labels, units, and mathematical language.

GMP6.4 Think about accuracy and efficiency when you count, measure, and calculate.

Go Online to the *Implementation Guide* for more information about the Mathematical Process and Practice Standards.

For students' information on the Mathematical Process and Practice Standards, see *Student Reference Book*, pages 1–34.

Lesson
2-6

Application: Unit Conversions

Overview **Students use unit conversions within the U.S. customary system to solve multistep problems.**

▶ Before You Begin

For Part 2, prepare a two-column table labeled *miles* and *feet*. Decide how you will display the number stories from pages 143 and 144. If additional sets of *Prism Pile-Up* cards are needed for Part 3, copy and cut apart *Math Masters*, pages G4 and G5.

▶ Vocabulary

measurement units • convert • number model • relation symbol • expression

Standards

Focus Clusters

- Write and interpret numerical expressions.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Convert like measurement units within a given measurement system.

1 Warm Up 5 min

	Materials	Standards
Mental Math and Fluency Students convert between units of length.		5.MD.1

2 Focus 35–40 min

Math Message Students solve a number story about converting miles to feet.	*Student Reference Book*, p. 328	5.MD.1
Converting Miles to Feet Students complete a table of conversions for miles to feet.	*Student Reference Book*, p. 328	5.NBT.5, 5.MD.1 SMP1
Solving Unit Conversion Number Stories Students solve number stories involving conversions of units within the U.S. customary system.	*Math Journal 1*, p. 52; *Student Reference Book*, p. 328; *Math Masters*, p. TA2 (optional)	5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1 SMP1, SMP4, SMP5
Assessment Check-In See page 144. Expect most students to be able to use U.S. customary unit conversions to solve problems like those identified.	*Math Journal 1*, p. 52	5.OA.2, 5.MD.1, SMP4

3 Practice 20–30 min

Playing *Prism Pile-Up* **Game** Students practice finding volumes of rectangular prisms and figures composed of rectangular prisms.	*Student Reference Book*, p. 319; per partnership: *Math Masters*, p. G6; *Prism Pile-Up* cards; calculator (optional)	5.OA.2, 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5, 5.MD.5a, 5.MD.5b, 5.MD.5c SMP1, SMP2
Math Boxes 2–6 Students practice and maintain skills.	*Math Journal 1*, p. 53	See page 145.
Home Link 2-6 **Homework** Students collect measurements and convert them to different units.	*Math Masters*, p. 55	5.NBT.5, 5.MD.1

Go Online to see how mastery develops for all standards within the grade.

Differentiation Options

Readiness 5–15 min

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Counting to Convert Inches to Feet

5.MD.1, SMP7

per group: three 12-inch rulers, 36 square pattern blocks

To explore unit conversions using a concrete model, students count how many 1-inch square pattern blocks are equal to the length of a 1-foot ruler. Distribute 36 square pattern blocks to each group, explaining that each pattern block is 1 inch long. Have students line up the blocks from one end of a 12-inch ruler to the other and then count them. Ask: *How many inches do you need to make a foot?* 12 inches Repeat with two 12-inch rulers and three 12-inch rulers. 24 inches; 36 inches Record the information in a two-column table. Ask: *What patterns do you see?* **GMP7.1** Sample answer: There are 12 more inches every time you add a foot.

Enrichment 15–30 min

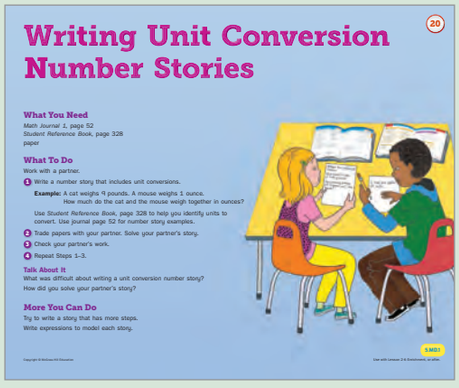
WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Writing Unit Conversion Number Stories

5.MD.1

Activity Card 20;
Math Journal 1, p. 52; *Student Reference Book*, p. 328

To extend their work with unit conversions, students write unit conversion number stories using the problems on journal page 52 as examples. Partners solve each other's number stories.



Extra Practice 5–15 min

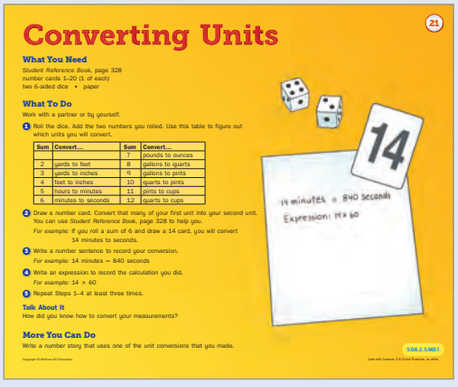
WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Converting Units

5.OA.2, 5.MD.1

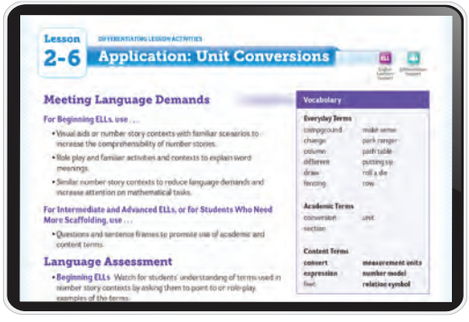
Activity Card 21;
Student Reference Book, p. 328; number cards 1–20 (1 of each); two 6-sided dice

For more practice with unit conversions, students roll dice and draw number cards to generate unit conversion problems. They write expressions recording their calculations and number sentences recording their conversions.



English Language Learner

Beginning ELL To familiarize students with U.S. customary *measurement units* and measuring tools, display everyday measuring tools labeled by name and showing common conversions. For example, label a 1-foot ruler with the word *ruler* and the units of measure: 1 foot = 12 inches. Other useful measurement tools to label and display include a yardstick and a measuring cup.



Differentiation Support pages are found in the online Teacher's Center.

Standards and Goals for Mathematical Process and Practice

SMP1 Make sense of problems and persevere in solving them.

GMP1.1 Make sense of your problem.

SMP4 Model with mathematics.

GMP4.1 Model real-world situations using graphs, drawings, tables, symbols, numbers, diagrams, and other representations.

SMP5 Use appropriate tools strategically.

GMP5.2 Use tools effectively and make sense of your results.

1 Warm Up 5 min

Mental Math and Fluency

Have students convert between units of length. *Leveled exercises:*

●○○ 1 foot equals how many inches? 12
1 yard equals how many feet? 3
2 yards equals how many feet? 6

●●○ 4 feet equals how many inches? 48
5 yards equals how many feet? 15
36 inches equals how many feet? 3

●●● $1\frac{1}{2}$ feet equals how many inches? 18
$5\frac{1}{2}$ feet equals how many inches? 66
54 inches equals how many feet? $4\frac{1}{2}$

2 Focus 35–40 min

Math Message

Student Reference Book, p. 328

Park rangers are putting up a fence along a 2-mile section of campground path. How many feet of fencing will they need? Use Student Reference Book, *page 328 to help you.*

Converting Miles to Feet

Student Reference Book, p. 328

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Math Message Follow-Up Have students share answers. 10,560 feet Ask: *What information did you need to know before you could solve the problem?* GMP1.1 The number of feet in 1 mile Discuss how students found the number of feet in 1 mile, and then ask: *Which is longer, a 1-mile section of path or a 5,280-foot section of path?* They are the same length. Explain that 1 mile and 5,280 feet are the same distance expressed in different **measurement units.** Explain to students that when they change the unit in which a measurement is expressed, they are **converting** a measurement to a different unit.

Display a two-column table labeled Miles and Feet. (*See margin.*) Fill in the numbers 1–5 in the Miles column and complete the first two rows of the Feet column. Ask: *How many feet of fencing would the rangers need for a 3-mile section of path?* 15,840 *How do you know?* There are 5,280 feet in each mile, and 3 * 5,280 = 15,840. *How many feet would they need for a 4-mile section?* 21,120 *A 5-mile section?* 26,400 Record the conversions in the table.

Miles	Feet
1	5,280
2	10,560
3	15,840
4	21,120
5	26,400

Conversions between miles and feet

Tell students that for many problems it is necessary to convert units before the problem can be solved. In today's lesson students will use multiplication to solve problems involving unit conversions.

▶ Solving Unit Conversion Number Stories

Math Journal 1, p. 52; *Student Reference Book*, p. 328

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Remind students that when solving problems, they should start by *making sense* of the problem, or thinking about what the problem asks and what information they need to solve it. GMP1.1 Techniques for making sense of a problem might include making a table or drawing a picture in addition to determining what information they need. Read or display the following number story. Have students solve it in partnerships or small groups. Tell them to refer to *Student Reference Book*, page 328 as needed. GMP5.2

> *An art teacher has 5 pounds of clay. Each student needs 1 ounce of clay to complete an art project. How many students can complete the art project?*

After students have worked on the problem, invite them to share strategies. Strategies students may use to help them make sense of the problem include drawing pictures like the one below or creating a conversion table for pounds and ounces, similar to the one shown for the Math Message Follow-Up. GMP1.1

Sample picture:

1 pound	1 pound	1 pound	1 pound	1 pound
16 ounces	16 ounces	16 ounces	16 ounces	16 ounces

Ask:

- *What information did you need to solve this problem?* GMP1.1 1 pound = 16 ounces
- *Where did you find that information?* GMP5.2 In the *Student Reference Book*
- *How can we find the number of ounces in 5 pounds?* Multiply 5 by 16

Remind students that **number models** represent real-world problems using only numbers and mathematical symbols. GMP4.1 Ask: *What number model can we use to show how we found the number of ounces in 5 pounds?* $5 * 16$ Tell students that a number model that has no **relation symbol** ($=$, $>$, $<$, $\leq$, $\geq$, or $\neq$) is called an **expression.** Expressions are often useful models because they can be evaluated to solve problems. The expression $5 * 16$ can be evaluated to find the number of ounces in 5 pounds.

Have students use U.S. traditional multiplication to multiply 5 by 16 and then check whether they get the same answer using other methods. Ask again: *How many students can complete the art project?* 80 students

Professional Development

This lesson focuses on conversions within the U.S. customary system. Because the number of smaller units in a larger unit varies greatly in the U.S. customary system (for example, there are 12 inches in a foot but 3 feet in a yard), converting between units is a good application of whole-number multiplication and division. To keep the focus on multiplication, this lesson emphasizes conversions from a larger unit to a smaller unit. Converting from smaller to larger units will be covered in ongoing practice following the division lessons later in Unit 2. In the metric system there are usually 10 smaller units in each next-larger unit (for example, a centimeter is equal to 10 millimeters, a decimeter to 10 centimeters, and so on). Conversions within the metric system are a good application of multiplying and dividing whole numbers and decimals by powers of 10. Conversions among metric units are a focus in Unit 4.

Academic Language Development

Students may be familiar with the term *expression* in the sense of an idiomatic or cultural phrase, as in: "It's just an expression." To extend students' understanding to the mathematical meaning of expression, have them work in groups to complete a 4-Square Graphic Organizer (*Math Masters*, page TA2), showing an example, a non-example, a student definition, and a description of a real-life scenario in which a mathematical expression might be used.

Adjusting the Activity

Differentiate Some students may find it easier to record number sentences to model the problems than to record expressions. For the multistep problems, some students may wish to record number sentences for each step. For example:

Convert yards to feet: $3 * 3 = 9$

Add the two lengths: $9 + 7 = 16$

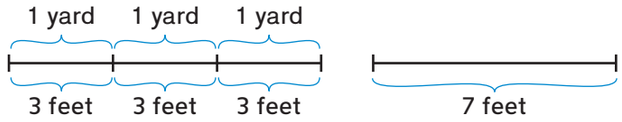
Go Online Differentiation Support

Read or display the following number story and have partnerships or groups work together to solve it. Encourage students to draw pictures to help them make sense of the problem, and tell them to write an expression to record the calculations. GMP1.1, GMP4.1

A camp counselor is building a bench to put near the fire pit. She has one piece of wood that is 3 yards long and one piece of wood that is 7 feet long. If she places these pieces of wood end to end to make the bench seat, what will the length of the bench be in feet?

After students have had time to work on the problem, invite them to share strategies. Some students may have drawn pictures like the one below.

Sample picture:

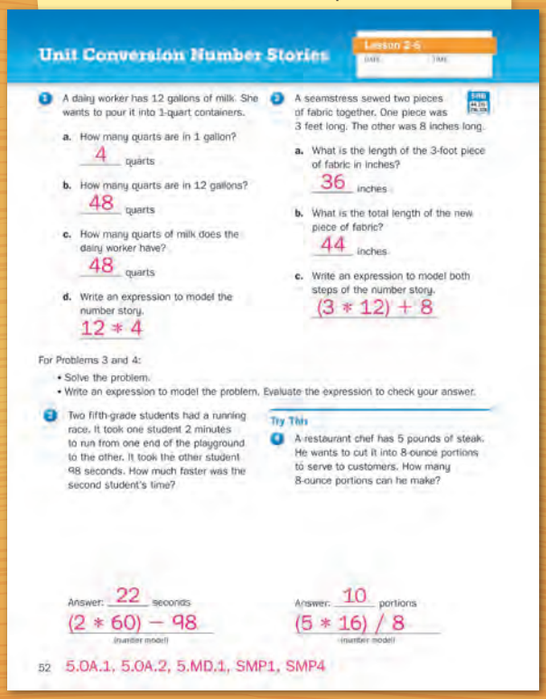


Ask:

- *What unit conversion do you need to know to solve this problem?* The number of feet in 1 yard *What expression shows how to find the number of feet in 3 yards?* $3 * 3$ Record the expression $3 * 3$.
- *What would you do next to solve the problem?* Add the length of the other piece of wood *What could we add to this expression to show that step?* $+ 7$ Add to the expression to show $3 * 3 + 7$.
- *How could we show that the multiplication happens first?* Add parentheses, brackets, or braces around $3 * 3$ Add grouping symbols to show $(3 * 3) + 7$.
- *Evaluate this expression. How long will the bench be?* 16 feet

Have partnerships complete journal page 52, where they model and solve problems involving unit conversions. GMP1.1, GMP4.1

Math Journal 1, p. 52



Unit Conversion Number Stories

Lesson 2-6

1. A dairy worker has 12 gallons of milk. She wants to pour it into 1-quart containers.
   a. How many quarts are in 1 gallon? 4 quarts
   b. How many quarts are in 12 gallons? 48 quarts
   c. How many quarts of milk does the dairy worker have? 48 quarts
   d. Write an expression to model the number story. 12 * 4

2. A seamstress sewed two pieces of fabric together. One piece was 3 feet long. The other was 8 inches long.
   a. What is the length of the 3-foot piece of fabric in inches? 36 inches
   b. What is the total length of the new piece of fabric? 44 inches
   c. Write an expression to model both steps of the number story. (3 * 12) + 8

For Problems 3 and 4:
- Solve the problem.
- Write an expression to model the problem. Evaluate the expression to check your answer.

3. Two fifth-grade students had a running race. It took one student 2 minutes to run from one end of the playground to the other. It took the other student 98 seconds. How much faster was the second student's time?

Answer: 22 seconds
(2 * 60) − 98 (number model)

Try This

4. A restaurant chef has 5 pounds of steak. He wants to cut it into 8-ounce portions to serve to customers. How many 8-ounce portions can he make?

Answer: 10 portions
(5 * 16) / 8 (number model)

52 5.OA.1, 5.OA.2, 5.MD.1, SMP1, SMP4

Assessment Check-In 5.OA.2, 5.MD.1

Math Journal 1, p. 52

Expect most students to be able to use U.S. customary unit conversions to solve Problems 1 and 2 on journal page 52. Some may be able to solve Problems 3 and 4, which do not identify the necessary conversions. Some students may also be able to write expressions to model the problems.

GMP4.1 For students who struggle to solve the problems, suggest that they make a two-column table relating the units in the problem, similar to the table of mile and feet equivalencies for the Math Message Follow-Up..

Evaluation Quick Entry Go online to record student progress and to see trajectories toward mastery for these standards.

Summarize Invite students to share and explain the number models they wrote for the problems on journal page 52.

3 Practice 20–30 min

▶ Playing *Prism Pile-Up*

Student Reference Book, p. 319; *Math Masters*, p. G6

WHOLE CLASS | **SMALL GROUP** | **PARTNER** | INDEPENDENT

Students practice calculating the volumes of rectangular prisms and figures composed of rectangular prisms. Have them record the volume of each figure and the number sentences they used for their calculations on *Math Masters*, page G6.

Observe

- Which students are counting to find the volumes of the figures? Which students are applying formulas?
- Which students can write a number sentence to represent their strategy? GMP2.1

Discuss

- *Did you use a formula to find the volume of the figure? If so, how did you decide which formula to use?* GMP2.2
- *Could you find the volume of the figure in a different way? How?* GMP1.5

Differentiate **Game Modifications** Go Online Differentiation Support

▶ Math Boxes 2-6

Math Journal 1, p. 53

WHOLE CLASS | **SMALL GROUP** | **PARTNER** | **INDEPENDENT**

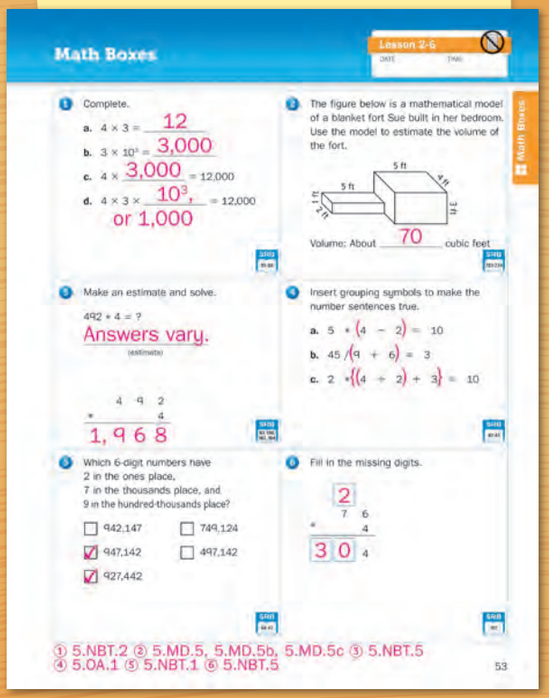
Mixed Practice Math Boxes 2-6 are paired with Math Boxes 2-8.

▶ Home Link 2-6

Math Masters, p. 55

Homework Students collect measurements and convert them to different units.

Math Journal 1, p. 53


Math Boxes

Lesson 2-6

1 Complete.
a. 4 × 3 = 12
b. 3 × 10³ = 3,000
c. 4 × 3,000 = 12,000
d. 4 × 3 × 10³, or 1,000 = 12,000

2 The figure below is a mathematical model of a blanket fort Sue built in her bedroom. Use the model to estimate the volume of the fort.
5 ft, 5 ft, 3 ft, 4 ft
Volume: About 70 cubic feet

3 Make an estimate and solve.
492 × 4 = ?
Answers vary. (estimate)
492 × 4 = 1,968

4 Insert grouping symbols to make the number sentences true.
a. 5 × (4 − 2) = 10
b. 45 / (9 + 6) = 3
c. 2 × {(4 + 2) + 3} = 10

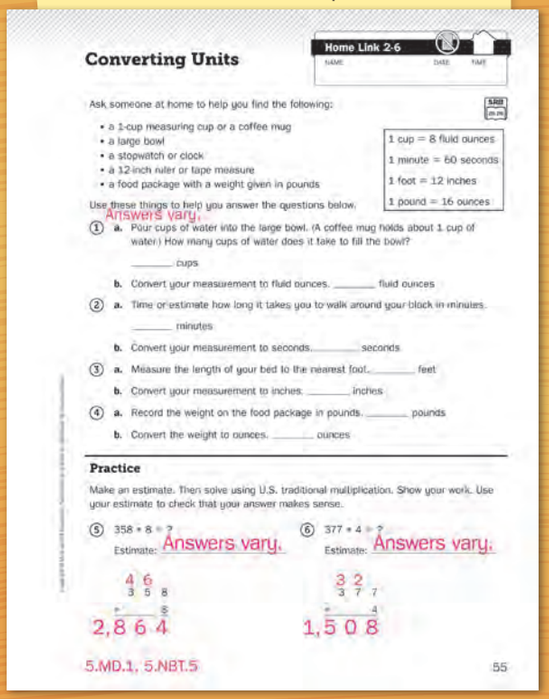
5 Which 6-digit numbers have 2 in the ones place, 7 in the thousands place, and 9 in the hundred-thousands place?
☐ 942,147 ☐ 749,124
☑ 947,142 ☐ 497,142
☑ 927,442

6 Fill in the missing digits.
2 7 6 × 4 = 3 0 4

① 5.NBT.2 ② 5.MD.5, 5.MD.5b, 5.MD.5c ③ 5.NBT.5 ④ 5.OA.1 ⑤ 5.NBT.1 ⑥ 5.NBT.5

53

Math Masters, p. 55


Converting Units

Home Link 2-6

Ask someone at home to help you find the following:
- a 1-cup measuring cup or a coffee mug
- a large bowl
- a stopwatch or clock
- a 12-inch ruler or tape measure
- a food package with a weight given in pounds

1 cup = 8 fluid ounces
1 minute = 60 seconds
1 foot = 12 inches
1 pound = 16 ounces

Use these things to help you answer the questions below.
Answers vary.
① a. Pour cups of water into the large bowl. (A coffee mug holds about 1 cup of water.) How many cups of water does it take to fill the bowl? _____ cups
b. Convert your measurement to fluid ounces. _____ fluid ounces
② a. Time or estimate how long it takes you to walk around your block in minutes. _____ minutes
b. Convert your measurement to seconds. _____ seconds
③ a. Measure the length of your bed to the nearest foot. _____ feet
b. Convert your measurement to inches. _____ inches
④ a. Record the weight on the food package in pounds. _____ pounds
b. Convert the weight to ounces. _____ ounces

Practice
Make an estimate. Then solve using U.S. traditional multiplication. Show your work. Use your estimate to check that your answer makes sense.
⑤ 358 × 8 = ? Estimate: Answers vary. 358 × 8 = 2,864
⑥ 377 × 4 = ? Estimate: Answers vary. 377 × 4 = 1,508

5.MD.1, 5.NBT.5

55

2-Day Lesson

2-9

Open Response and Reengagement

One Million Taps

Overview **Day 1:** Students estimate how much time it would take to tap their desks one million times. **Day 2:** Students examine others' solutions using a rubric or in a class discussion, and they revise their work.

Day 1: Open Response

▶ Before You Begin

Solve the open response problem in as many ways as you can. If possible, schedule time to review students' work and plan for Day 2 of this lesson with your grade-level team.

▶ Vocabulary

efficient

Standards

Focus Clusters

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

1 Warm Up 5 min

	Materials	Standards
Mental Math and Fluency Students write numbers in exponential notation.	slate	5.NBT.2

2a Focus 55–65 min

Math Message Students estimate the amount of time it takes to address 10 and 100 envelopes based on the amount of time it takes to address 1 envelope.	*Math Journal 1*, p. 58	5.NBT.2, 5.NBT.5
Discussing Efficient Strategies Students discuss strategies for solving the Math Message and consider which ones are more efficient.	*Math Journal 1*, p. 58; Standards for Mathematical Process and Practice Poster	5.NBT.2 SMP1, SMP4, SMP6
Solving the Open Response Problem Students find the time it takes to tap their desks 100 times and estimate how much time it would take to tap their desks 1,000,000 times.	*Math Masters*, pp. 61–62; per partnership: stopwatch (optional)	5.NBT.2 SMP1, SMP6

Getting Ready for Day 2 →

Review students' work and plan discussion for reengagement. *Math Masters*, p. TA4, p. 63 (optional); students' work from Day 1

Go Online to see how mastery develops for all standards within the grade.

1 Warm Up 5 min

Mental Math and Fluency

Display the following. Have students write the number or product as a power of 10 with exponents on slates. *Leveled exercises:*

●○○ $10 * 1 = 10^1$
$10 * 10 = 10^2$
$10 * 10 * 10 = 10^3$

●●○ $1{,}000 = 10^3$
$10{,}000 = 10^4$
$1{,}000{,}000 = 10^6$

●●● $10 * 100 = 10^3$
$100 * 100 = 10^4$
$1{,}000 * 100 = 10^5$

2a Focus 55–65 min

Math Message

Math Journal 1, p. 58

Work with a partner to complete journal page 58.

Differentiate **Adjusting the Activity**

For students who have trouble getting started, suggest that they draw a picture to represent the amount of time it took to address each envelope. For example, they might draw 10 envelopes and label each 30 seconds for the time it takes to label one. Ask: *How can you find the total amount of time it takes to address 10 envelopes?* Sample answers: I can multiply 30 by 10. I can add up all of the seconds. *How did your picture help you solve the problem?* GMP4.2 Sample answer: It helped me see that I needed to add up all the seconds it would take to address all 10 envelopes.

Discussing Efficient Strategies

Math Journal 1, p. 58

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Math Message Follow-Up Have partners discuss how they solved Problem 1 on the journal page and then share strategies with the class. Strategies might include drawing a picture of the 10 envelopes, using repeated addition, or using multiplication. GMP1.6, GMP4.2

Standards and Goals for Mathematical Process and Practice

SMP1 Make sense of problems and persevere in solving them.
GMP1.6 Compare the strategies you and others use.

SMP4 Model with mathematics.
GMP4.2 Use mathematical models to solve problems and answer questions.

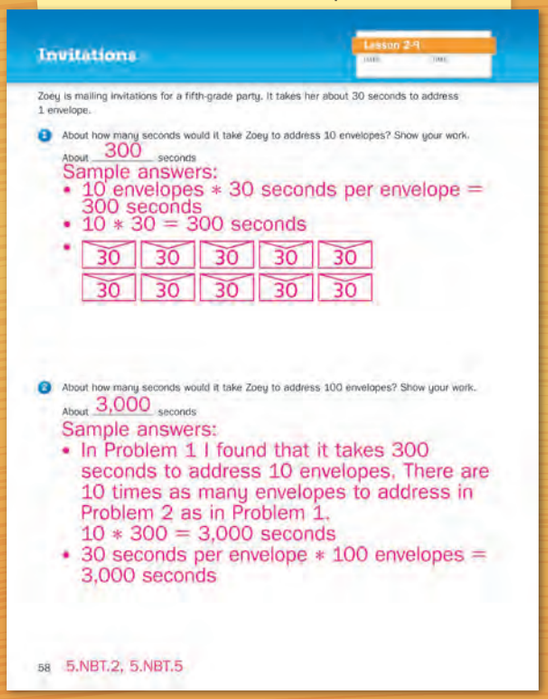
SMP6 Attend to precision.
GMP6.4 Think about accuracy and efficiency when you count, measure, and calculate.

Professional Development

The focus for this lesson is GMP6.4. While multiple strategies can be used to solve the open response problem, the emphasis here is on efficiency. *Efficiency* in this context means solving a problem in a way that minimizes time and effort. As students compare strategies, they will discuss which are most efficient. For more information on GMP6.4, see the Mathematical Background in the Unit Organizer.

Go Online for information about SMP6 in the *Implementation Guide*.

Math Journal 1, p. 58



Invitations

Lesson 2-9

Zoey is mailing invitations for a fifth-grade party. It takes her about 30 seconds to address 1 envelope.

3 About how many seconds would it take Zoey to address 10 envelopes? Show your work.

About 300 seconds

Sample answers:
- 10 envelopes * 30 seconds per envelope = 300 seconds
- 10 * 30 = 300 seconds
- 30 30 30 30 30 / 30 30 30 30 30

4 About how many seconds would it take Zoey to address 100 envelopes? Show your work.

About 3,000 seconds

Sample answers:
- In Problem 1 I found that it takes 300 seconds to address 10 envelopes. There are 10 times as many envelopes to address in Problem 2 as in Problem 1. 10 * 300 = 3,000 seconds
- 30 seconds per envelope * 100 envelopes = 3,000 seconds

58 5.NBT.2, 5.NBT.5

ELL Support

Prior to the lesson, use role-play activities to introduce students to the contexts of addressing an envelope and tapping a desk. Point out various uses of the word *address*. Once students understand the basic vocabulary, use simple problems to familiarize them with the concept of scaling, such as: *If I can write 2 addresses in 1 minute, how many addresses can I write in 3 minutes? How long will it take me to address 6 envelopes? Explain how you found your answer.* Ask similar questions about tapping a desk. During this discussion, introduce other vocabulary that may be new to students, such as *interruption, estimate, strategy,* or *guess*.

Time (seconds)	30	300	3,000
Number of Envelopes	1	10	100

Table modeling the Math Message problem

Have partners discuss how they solved Problem 2, and then have them share their thinking. Students may have used strategies similar to those in Problem 1, or they may have used their solution from Problem 1 to solve Problem 2. GMP1.6, GMP4.2 Ask: *Of the strategies we used in Problem 1, which could we also use in Problem 2?* Sample answer: We could multiply the number of seconds it took to address 1 envelope by the number of envelopes we need to address. *Were there any strategies from Problem 1 that you would not use in Problem 2?* Sample answer: Drawing a picture of the exact number of envelopes would not make sense because it would take a lot of time to draw 100 envelopes.

Display the table shown in the margin. Ask: *How does the table model the problems?* GMP4.2 Sample answer: The first column shows that it takes 30 seconds to address 1 envelope. The bottom row shows the number of envelopes to address. We can complete the top row to answer how long it takes to address 10 and 100 envelopes.

Ask: *What patterns do you notice in the row for the number of envelopes?* Sample answer: As you move to the right, the number of envelopes is 10 times the number in the column to the left. $1 * 10 = 10$ and $10 * 10 = 100$

Have partners discuss how they think they could use this table to solve the problem. Sample answers: If you know the time it takes to address 1 envelope, you can find the amount of time it takes to address 10 or 100 envelopes. You can multiply $30 * 10$ to find the number of seconds it takes to address 10 envelopes. You can multiply $30 * 100$ to get the amount of time it takes to address 100 envelopes.

Ask: *Does using the table give you the same answer as the strategies we discussed earlier?* Yes. *How does the table help you?* GMP4.2, GMP6.4 Sample answers: It models the problem; organizes the information; helps you see patterns; and helps you think efficiently.

Tell students that even though there are often multiple ways to solve a problem, mathematicians try to solve problems in the most **efficient** way. Efficiency refers to solving a problem in a way that minimizes time and effort. Refer students to the Standards for Mathematical Process and Practice Poster for **GMP6.4**. Ask: *Of the strategies we discussed for this problem, which are most efficient? Why?* Sample answer: Using a table or number sentence is more efficient than drawing a picture of each envelope because it takes a long time to draw and label each envelope. It takes less time to write out a number sentence. Tell students that they should think about efficiency when solving the open response problem. GMP6.4

Solving the Open Response Problem

Math Masters, pp. 61–62

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Distribute *Math Masters,* pages 61 and 62. Read Problems 1–3 as a class and review the directions. Partners should work together to ensure that they understand the problems. For Problem 2, tell students that they can tap their desks at any speed as long as they are able to count each tap. One partner should keep time with a stopwatch or a clock with a second hand while the other taps to 100. Then they switch roles. Remind students that for Problem 3 they do not need to write anything, but they should discuss their thinking with a partner. GMP1.6

When students have completed Problem 3, read Problems 4 and 5 as a class and answer any questions about them. Point out that the task in Problem 4 is to make sense of Maya's strategy and explain whether they think it is efficient. GMP6.4 Remind students to use their answers to Problem 2 to make an estimate for Problem 5. Have students write their answers to Problems 4 and 5 on a separate sheet of paper.

While students work, circulate and ask questions such as:

- *In Problem 4, how did Maya start? What was her next step?* GMP1.6
  Answers vary.
- *Why did you decide to make your estimate for Problem 5 this way? Is there a more efficient way to solve the problem?* GMP6.4
  Answers vary.

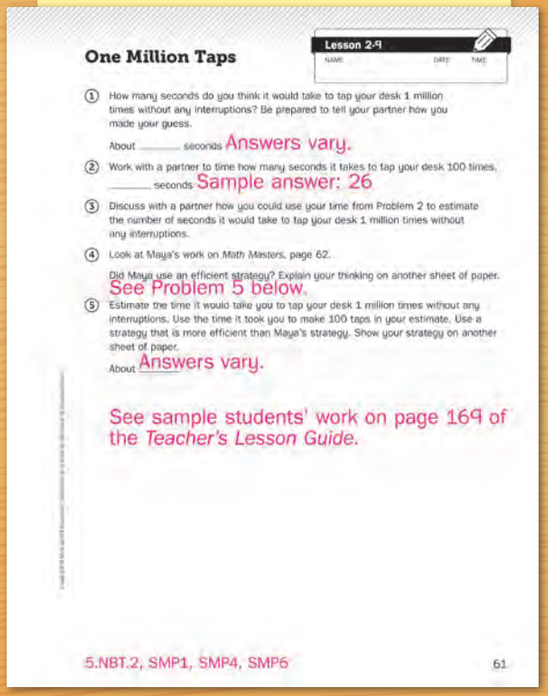
Differentiate **Adjusting the Activity**

If students have trouble developing a plan that is more efficient than Maya's, ask: *Do you notice any patterns in the number of zeros? Can you use patterns to solve the problem more efficiently?* GMP6.4 Answers vary. Remind students of the table discussed in the Math Message Follow-Up.

Summarize Ask: *How does your guess for Problem 1 compare to the calculated estimate for Problem 5?* Answers vary. *Did you calculate the exact time it would take to make 1,000,000 taps? Why or why not?* GMP6.4 No, the estimate I calculated is not the exact time, but since we used the number of taps we counted, it is more accurate than the first guess.

Remind students that they will continue to discuss how to solve the problem more efficiently during the reengagement discussion. Collect students' work so that you can evaluate it and prepare for Day 2.

Math Masters, p. 61



Lesson 2-9

NAME DATE TIME

One Million Taps

1. How many seconds do you think it would take to tap your desk 1 million times without any interruptions? Be prepared to tell your partner how you made your guess.

   About _____ seconds Answers vary.

2. Work with a partner to time how many seconds it takes to tap your desk 100 times.

   _____ seconds Sample answer: 26

3. Discuss with a partner how you could use your time from Problem 2 to estimate the number of seconds it would take to tap your desk 1 million times without any interruptions.

4. Look at Maya's work on *Math Masters,* page 62.

   Did Maya use an efficient strategy? Explain your thinking on another sheet of paper.

   See Problem 5 below.

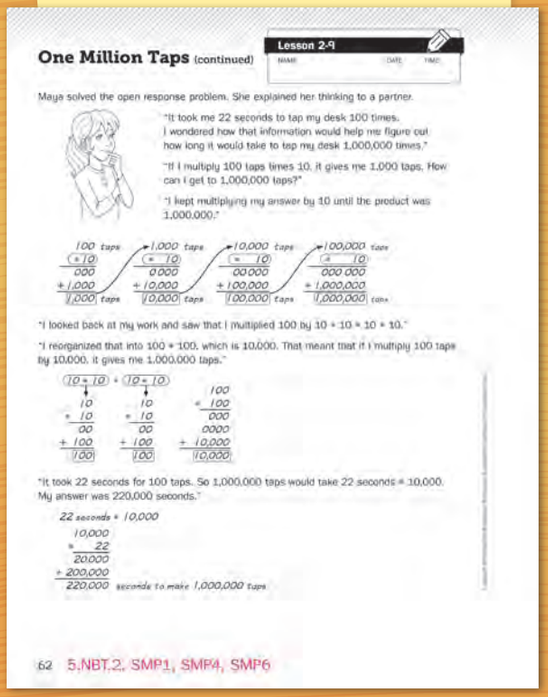
5. Estimate the time it would take you to tap your desk 1 million times without any interruptions. Use the time it took you to make 100 taps in your estimate. Use a strategy that is more efficient than Maya's strategy. Show your strategy on another sheet of paper.

   About Answers vary.

See sample students' work on page 169 of the *Teacher's Lesson Guide.*

5.NBT.2, SMP1, SMP4, SMP6 61

Math Masters, p. 62



One Million Taps (continued)

Lesson 2-9

NAME DATE TIME

Maya solved the open response problem. She explained her thinking to a partner.

"It took me 22 seconds to tap my desk 100 times. I wondered how that information would help me figure out how long it would take to tap my desk 1,000,000 times."

"If I multiply 100 taps times 10, it gives me 1,000 taps. How can I get to 1,000,000 taps?"

"I kept multiplying my answer by 10 until the product was 1,000,000."

100 taps → 1,000 taps → 10,000 taps → 100,000 taps → 1,000,000 taps

"I looked back at my work and saw that I multiplied 100 by 10 × 10 × 10 × 10."

"I reorganized that into 100 × 100, which is 10,000. That meant that if I multiply 100 taps by 10,000, it gives me 1,000,000 taps."

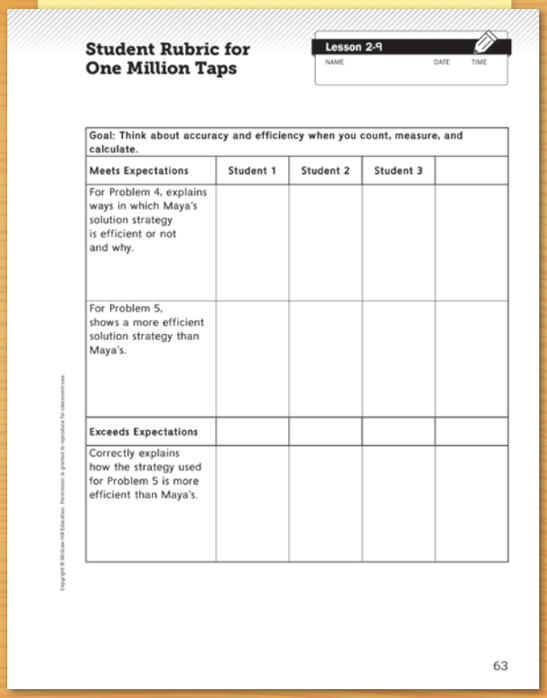
"It took 22 seconds for 100 taps. So 1,000,000 taps would take 22 seconds × 10,000. My answer was 220,000 seconds."

22 seconds × 10,000

220,000 seconds to make 1,000,000 taps

62 5.NBT.2, SMP1, SMP4, SMP6

Math Masters, p. 63



Student Rubric for One Million Taps

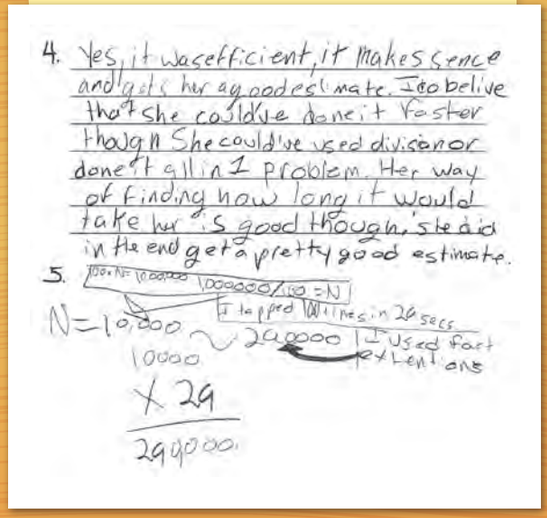
Lesson 2-9

NAME DATE TIME

Goal: Think about accuracy and efficiency when you count, measure, and calculate.				
Meets Expectations	**Student 1**	**Student 2**	**Student 3**	
For Problem 4, explains ways in which Maya's solution strategy is efficient or not and why.				
For Problem 5, shows a more efficient solution strategy than Maya's.				
Exceeds Expectations				
Correctly explains how the strategy used for Problem 5 is more efficient than Maya's.				

63

Sample student's work, Student A



4. Yes, it was efficient, it makes sence and gets her a good estimate. I do belive that she could've done it faster though She could've used division or done it all in 1 problem. Her way of finding how long it would take her is good though, she did in the end get a pretty good estimate.

5. 100 x N = 1000000 / 100 = N

N = 10,000 ~ 290000 I used fast extent one

10000 x 29 = 290000

Getting Ready for Day 2

Math Masters, p. TA4

Planning a Follow-Up Discussion

Review students' work. Use the Reengagement Planning Form (*Math Masters*, page TA4) and the rubric on page 166 to plan ways to help students meet expectations for both the content and practice standards.

This lesson introduces the use of a student-friendly rubric. Organize a peer discussion using a student-friendly rubric as described in Option 1 below. Or, facilitate a class discussion as described in Options 2 through 4 or in another way you choose. If students' work is unclear or if you prefer to show work anonymously, rewrite the work for peer review or display.

Go Online for sample students' work that you can use in your discussion.

1. Have partners review and discuss student work using the student-friendly rubric on *Math Masters*, page 63. Choose work from three students showing a range of explanations for Problem 4. Be sure to choose work with mathematically reasonable estimates for Problem 5 so that the peer review can focus on the efficiency of the strategy instead of calculation errors. Choose at least one sample that meets expectations because the student met criteria in the student rubric for both Problems 4 and 5, as in Student A's work. Choose a second sample that partially meets expectations because it met only one of the criteria. The third sample can meet expectations by showing thinking in a different way or exceed expectations. Label the three samples Student 1, Student 2, and Student 3 (or print them on different colored paper), and make enough copies so that students can review all three samples in partnerships. Plan to model how to use the rubric with Student 1's work and for partners to work together to review the work of Students 2 and 3. See the section on Reengaging in the Problem on Day 2 for more information.

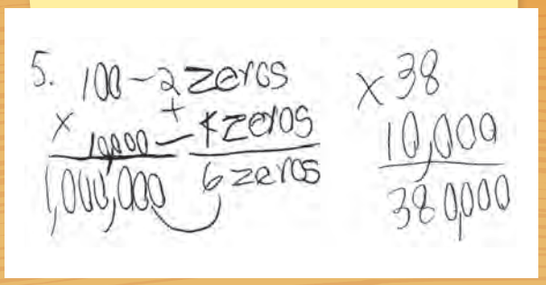
For a whole-class discussion, use questions similar to those below.

2. Display a response for Problem 5, such as Student B's, that shows a different strategy than Maya's. Ask: *Which strategy is more efficient and why?* GMP1.6, GMP4.2, GMP6.4 Sample answer: This strategy is more efficient than Maya's because this student used powers of 10, so it was much faster. The student figured out that 100 * 10,000 = 1,000,000 by counting the difference in zeros between 1,000,000 and 100. Maya multiplied 100 by 10 again and again until she got to 1,000,000 and then had to multiply all of those 10s together to get 10,000.
3. Display a response to Problem 5 that is incomplete or incorrect, as in Student C's work. Ask: *Do you agree or disagree with this solution? Explain.* GMP1.6 Sample answer: I disagree because multiplying 100 taps by 10,000 gives you 1,000,000 taps. We already knew we were looking for 1,000,000 taps. The student needed to multiply the amount of time it took to make 100 taps by 10,000 to find how many seconds it would take to make 1,000,000 taps.
4. Display samples of student work containing different computation errors. Ask: *What was this student trying to do? What would you say to this student to explain how to correct the errors?* Answers vary.

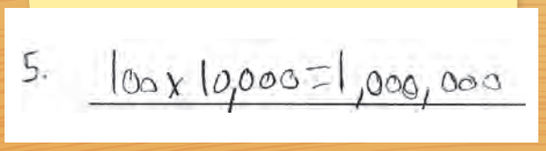
Planning for Revisions

Have copies of *Math Masters,* pages 61 and 62 or extra paper available for students to use in revisions. You might want to ask students to use colored pencils so that you can see what they revised.

Sample student's work, Student B



Sample student's work, Student C



One Million Taps

Overview **Day 2: Students examine others' solutions using a rubric or in a class discussion, and they revise their work.**

Day 2: Reengagement

▶ Before You Begin

Have extra copies of Math Masters, pages 61 and 62 available for students to revise their work. See Option 1 in Getting Ready for Day 2 for information on preparing for a peer review using a student-friendly rubric.

2b Focus 50–55 min

	Materials	Standards Focus Cluster • Understand the place value system.
Setting Expectations Students review how to discuss other students' work respectfully. They also review the open response problem and discuss what a good response might include.	Guidelines for Discussions Poster, Standards for Mathematical Process and Practice Poster	SMP6
Reengaging in the Problem Students examine other students' work using a rubric as a guide or in a class discussion.	*Math Masters*, p. 63 (optional); selected samples of students' work	5.NBT.2 SMP1, SMP4 , SMP6
Revising Work Students revise their work from Day 1.	*Math Masters*, pp. 61–62 (optional), p. 63; students' work from Day 1; colored pencils (optional)	5.NBT.2 SMP1, SMP6
Assessment Check-In See page 169 and the rubric below. Expect that most students will be able to calculate a reasonable estimate of the time it takes to make one million taps using patterns of powers of 10.		5.NBT.2, SMP6

Goal for Mathematical Process and Practice	Not Meeting Expectations	Partially Meeting Expectations	Meeting Expectations	Exceeding Expectations
GMP6.4 Think about accuracy and efficiency when you count, measure, and calculate.	For Problem 4, does not address the efficiency of Maya's strategy, and for Problem 5, does not use a more efficient strategy.	For Problem 4, addresses an aspect of the efficiency of Maya's strategy (see Meeting Expectations), or for Problem 5, uses a more efficient strategy than Maya's (see Meeting Expectations).	For Problem 4, addresses an aspect of the efficiency of Maya's strategy (such as saying it is inefficient because of too many steps or because the steps are tedious; or it is efficient because she timed just 100 taps), and for Problem 5, uses a more efficient strategy than Maya's (such as applying powers of 10).	Meets expectations and correctly explains how the strategy used for Problem 5 is more efficient than Maya's.

3 Practice 10–15 min

Math Boxes 2-9 Students practice and maintain skills.	*Math Journal 1*, p. 59	See page 168.
Home Link 2-9 **Homework** Students multiply by multiples of 10 to make estimates.	*Math Masters*, p. 64	5.NBT.2, 5.NBT.5

Go Online to see how mastery develops for all standards within the grade.

2b Focus 50–55 min

Setting Expectations

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Revisiting Guidelines for Reengagement

To promote a cooperative environment, consider revisiting the class guidelines for discussion that you developed in Unit 1. After reviewing the guidelines, have students reflect on how well they are following them. Solicit additional guidelines from the class. Your revised list might look like the one in the margin.

Revisit some of the sentence frames from Unit 1 to model using appropriate language and encourage students to do the same when discussing others' work. Add more frames to the list, such as the following:

- I like how _____.
- I wonder why _____.

Reviewing the Problem

Briefly review the open response problem from Day 1. Ask: *What were you asked to do?* GMP6.4 Sample answer: We had to find the time it took to tap our desks 100 times and use that information to estimate how much time it would take to tap our desks 1,000,000 times. We had to decide whether Maya's solution strategy was efficient or not and try to solve the problem in a more efficient way. *What do you think a good response would include?* It should have an explanation of whether Maya's solution was efficient and show how it was possible to calculate an estimate of 1,000,000 taps using a strategy that is more efficient than Maya's. It also might explain why the solution strategy is more efficient than Maya's.

After this brief discussion, tell students that they are going to look at other students' work and see whether they thought about the problem in the same way. Refer to **GMP6.4** on the Standards for Mathematical Process and Practice Poster. Explain to students that they will figure out how other students decided whether Maya's solution was efficient. They will also look at how other students tried to solve the problem in a more efficient way than Maya.

NOTE These Day 2 activities will ideally take place within a few days of Day 1. Prior to beginning Day 2, see Planning a Follow-Up Discussion from Day 1.

Guidelines for Discussion

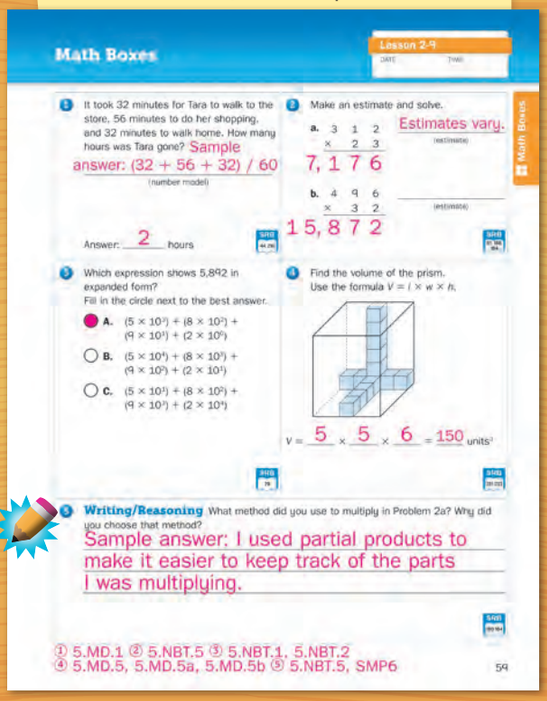
During our discussions, we can:

- ✓ *Make mistakes and learn from them.*
- ✓ *Share ideas and strategies respectfully.*
- ✓ *Change our minds about how to solve a problem.*
- ✓ *Ask questions of our teacher and classmates.*
- ✓ *Feel confused.*
- ✓ *Listen closely to others' ideas.*
- ✓ *Be patient.*

Adjusting the Activity

Differentiate Challenge students who successfully estimate the time of 1,000,000 taps in seconds to find the time in minutes, hours, or days. Ask: *Why might someone be interested in using a different unit than seconds?* Sample answer: We don't usually report time with this many seconds. Giving the time in minutes or hours would make more sense.

Math Journal 1, p. 59



Math Boxes

Lesson 2-9

1. It took 32 minutes for Tara to walk to the store, 56 minutes to do her shopping, and 32 minutes to walk home. How many hours was Tara gone? Sample answer: (32 + 56 + 32) / 60 (number model)

   Answer: 2 hours

2. Make an estimate and solve.

   a. 312 × 23 — Estimates vary. (estimate)

   7,176

   b. 496 × 32 — (estimate)

   15,872

3. Which expression shows 5,892 in expanded form?
   Fill in the circle next to the best answer.

   - A. (5 × 10³) + (8 × 10²) + (9 × 10¹) + (2 × 10⁰)
   - B. (5 × 10⁴) + (8 × 10³) + (9 × 10²) + (2 × 10¹)
   - C. (5 × 10³) + (8 × 10²) + (9 × 10¹) + (2 × 10⁰)

4. Find the volume of the prism.
   Use the formula V = l × w × h.

   V = 5 × 5 × 6 = 150 units³

5. Writing/Reasoning What method did you use to multiply in Problem 2a? Why did you choose that method?
   Sample answer: I used partial products to make it easier to keep track of the parts I was multiplying.

① 5.MD.1 ② 5.NBT.5 ③ 5.NBT.1, 5.NBT.2
④ 5.MD.5, 5.MD.5a, 5.MD.5b ⑤ 5.NBT.5, SMP6

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▸ Reengaging in the Problem

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Students reengage in the problem by analyzing and critiquing other students' work through a peer review or class discussion. Guide this discussion based on the decisions you made in Getting Ready for Day 2. GMP1.6, GMP4.2, GMP6.4

If you planned to facilitate a peer review using a student-friendly rubric as described in Option 1 on page 164, use *Math Masters*, page 63 to structure students' analysis of sample work. Distribute copies of the samples you chose for Students 1, 2, and 3 and student-friendly rubrics to each partnership. Briefly discuss **GMP6.4**, which is written at the top of the student rubric. Model reviewing Student 1's work with the class. Point out that to meet expectations the work must clearly meet the criteria listed under Meets Expectations for both Problems 4 and 5. Ask students to explain how the work meets or does not meet each of the criteria and write "Yes" or "No" in the appropriate boxes. Ask: *What would a paper look like that exceeds or goes beyond expectations?* Sample answer: The student would correctly explain how his or her strategy is more efficient than Maya's.

Have partners review the problem together and come to a decision on how they would evaluate work from Students 2 and 3 using the rubric. Conclude by discussing partners' choices for each work sample. Ask students to support their choices by showing how each piece of work met or did not meet each of the criteria. GMP1.6, GMP6.4

▸ Revising Work

Math Masters, p. 63

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Pass back students' work from Day 1. Before students revise anything, ask them to examine their own work. Whether you chose to conduct a peer review or a class discussion, have students use the student-friendly rubric to decide whether their work meets expectations for Problems 4 and 5. Have students add their names to the last column of the rubric and write "Yes" or "No" in the boxes for their own work. GMP1.6, GMP6.4

Tell students they now have a chance to revise their work. Those who wrote complete explanations for Maya's strategy and found an efficient estimate on Day 1 can explain how their strategy is more efficient than Maya's. Help students see that the explanations presented during the reengagement discussion are not the only correct ones. Tell them to add to their earlier work using colored pencils or another sheet of paper, instead of erasing their original work. GMP1.6, GMP6.4

Summarize Ask students to reflect on their work and revisions. Ask: *What did you do to improve your explanation or estimate more efficiently?* Answers vary.

Assessment Check-In 5.NBT.2

Collect and review students' revised work. Expect students to improve their work based on the class discussion. For the content standard, expect most students to calculate a reasonable estimate of the time it takes to make one million taps using patterns of powers of 10. You can use the rubric on page 166 to evaluate students' revised work for GMP6.4.

Evaluation Quick Entry Go online to record student progress and to see trajectories toward mastery for these standards.

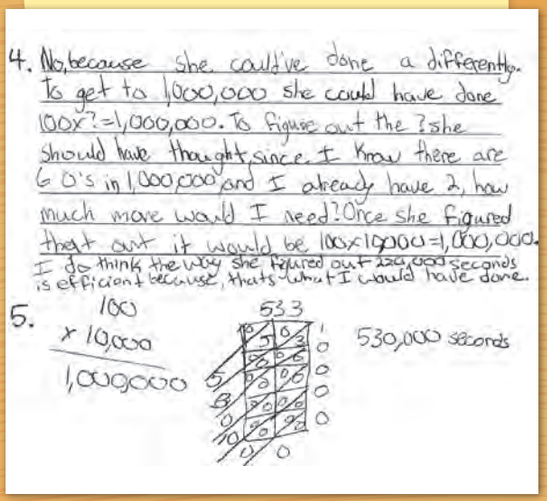
Go Online for optional generic rubrics in the *Assessment Handbook* that can be used to assess any additional GMPs addressed in this lesson.

Sample Students' Work—Evaluated

See the sample in the margin. This work meets expectations for the content standard because the student used patterns of powers of 10 to figure out "100 * ? = 1,000,000." The work meets expectations for the mathematical process and practice standard because for Problem 4 the student showed how to use "division" (by finding the missing factor) and extended facts to improve the efficiency of Maya's solution. Although the student used lattice multiplication for Problem 5, which is less efficient than using powers of 10 and extended facts, the student's strategy is more efficient than Maya's because it required fewer steps. GMP6.4

Go Online for other samples of evaluated students' work.

Sample student's work, "Meeting Expectations"



3 Practice 10–15 min

Math Boxes 2-9

Math Journal 1, p. 59

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

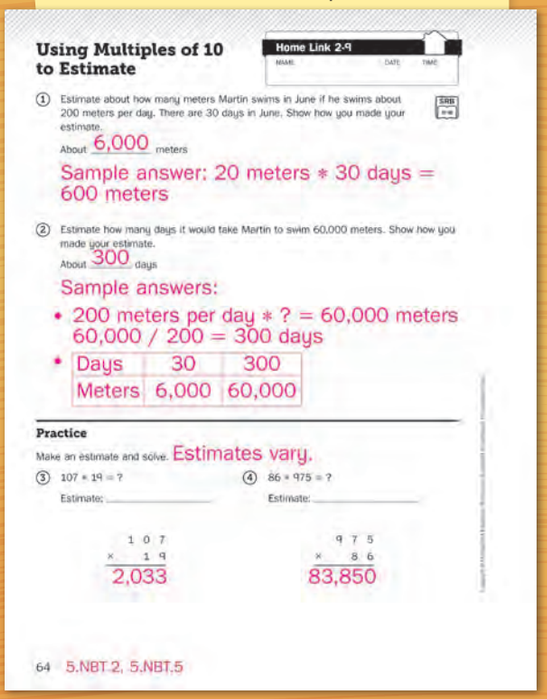
Mixed Practice Math Boxes 2-9 are paired with Math Boxes 2-12.

Home Link 2-9

Math Masters, p. 64

Homework Students multiply by multiples of 10 to make estimates.

Math Masters, p. 64



2-Day Lesson

2-14

Assessments

Unit 2 Progress Check

Overview **Day 1:** Administer the Unit Assessments.
Day 2: Administer the Cumulative Assessment.

Day 1: Unit Assessment

Quick Entry Evaluation Record results and track progress toward mastery.

1 Warm Up 5–10 min

Materials

Self Assessment
Students complete the Self Assessment.
Assessment Handbook, p. 14

2a Assess 35–50 min

Unit 2 Assessment
These items reflect mastery expectations to this point.
Assessment Handbook, pp. 15–18

Unit 2 Challenge (Optional)
Students may demonstrate progress beyond expectations.
Assessment Handbook, pp. 19–20

Standards	Goals for Mathematical Content (GMC)	Lessons	Self Assessment	Unit 2 Assessment	Unit 2 Challenge
5.OA.1	Write numerical expressions that contain grouping symbols.	2-6		8	
5.OA.2	Model real-world and mathematical situations using simple expressions.	2-6		8	4
	Interpret numerical expressions without evaluating them.	2-7			1a
5.NBT.1	Understand the relationship between the places in multidigit numbers.	2-1, 2-2	1, 2	1, 2, 6	
5.NBT.2	Use whole-number exponents to denote powers of 10.	2-2, 2-3	3	4	
	Multiply whole numbers by powers of 10; explain the number of zeros in the product.	2-2, 2-3, 2-9, 2-10	4	3a, 5a, 5b	1b
5.NBT.5	Fluently multiply multidigit whole numbers using the standard algorithm.	2-4 to 2-9	5	10, 11	2
5.NBT.6	Divide multidigit whole numbers.	2-10 to 2-13	6	9, 12, 13	3
	Illustrate and explain solutions to division problems.	2-11 to 2-13	7	9	3
5.MD.1	Convert among measurement units within the same system.	2-6		7, 8	4
	Use measurement conversions to solve multi-step, real-world problems.	2-6		8	4

Standards	Goals for Mathematical Process and Practice (GMP)	Lessons	Self Assessment	Unit 2 Assessment	Unit 2 Challenge
SMP1	Make sense of your problem. GMP1.1	2-6		8, 9	1c, 4
SMP2	Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs, and concrete objects. GMP2.1	2-7, 2-11, 2-12			3
SMP4	Model real-world situations using graphs, drawings, tables, symbols, numbers, diagrams, and other representations. GMP4.1	2-6, 2-13		8, 9	4
	Use mathematical models to solve problems and answer questions. GMP4.2	2-9, 2-13		9	
SMP6	Explain your mathematical thinking clearly and precisely. GMP6.1	2-2, 2-3		3b, 5b	1c
	Think about accuracy and efficiency when you count, measure, and calculate. GMP6.4	2-3, 2-8 to 2-10, 2-12		3b	2
SMP7	Use structures to solve problems and answer questions. GMP7.2	2-1, 2-2, 2-10		5b	

Go Online to see how mastery develops for all standards within the grade.

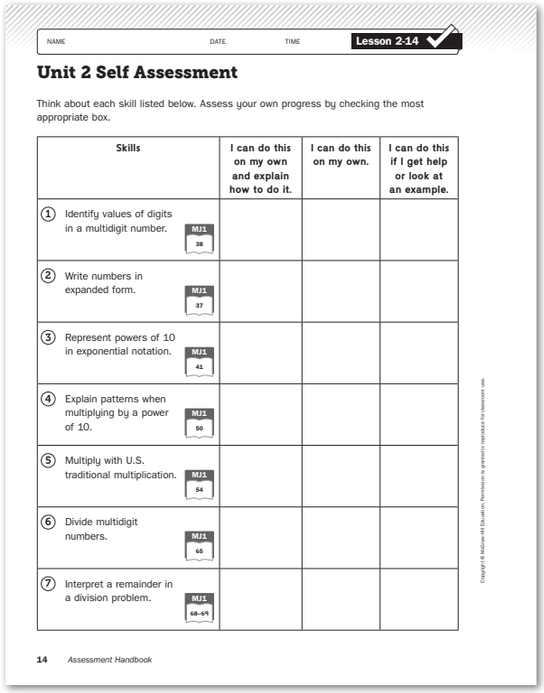
1 Warm Up 5–10 min

Self Assessment

Assessment Handbook, p. 14

WHOLE CLASS | SMALL GROUP | PARTNER | **INDEPENDENT**

Students complete the Self Assessment to reflect on their progress in Unit 2.



NAME DATE TIME Lesson 2-14

Unit 2 Self Assessment

Think about each skill listed below. Assess your own progress by checking the most appropriate box.

Skills	I can do this on my own and explain how to do it.	I can do this on my own.	I can do this if I get help or look at an example.
1 Identify values of digits in a multidigit number. MJ1 38			
2 Write numbers in expanded form. MJ1 37			
3 Represent powers of 10 in exponential notation. MJ1 41			
4 Explain patterns when multiplying by a power of 10. MJ1 50			
5 Multiply with U.S. traditional multiplication. MJ1 54			
6 Divide multidigit numbers. MJ1 65			
7 Interpret a remainder in a division problem. MJ1 68–69			

14 *Assessment Handbook*

Assessment Handbook, p. 14

Assessment Handbook, p. 15

NAME DATE TIME **Lesson 2-14**

Unit 2 Assessment

Solve the following number riddles.

1. I am a 5-digit number.
   My 3 is worth 3 * 10,000.
   My 4 is worth 4,000.
   One of my 2s is worth 20. The other 2 is worth 10 times as much.
   My other digit is 7.
   What number am I? 34,227

2. I am a 6-digit number.
   One of my 7s is worth 700,000. The other 7 is worth $\frac{1}{10}$ as much.
   My 8 is worth 8 [100s].
   My 9 is worth 90.
   My other digits are 0.
   What number am I? 770,890

3. **a.** Jesse collects cans for recycling. When he has 1,500 cans, the recycling center will pick them up from his house. Jesse has 120 bags with about 35 cans in each bag. Should he call the recycling center to arrange a pick-up? Explain how you know.

   Sample answer: Yes, Jesse should call the recycling center. I estimated 100 * 35 = 3,500 cans. That is more than 1,500 cans.

   b. Did you have to find an exact answer to solve Problem 3a? Explain why or why not.
   Sample answer: No. When I estimated it gave me enough information to answer the question.

Assessment Masters 15

2a Assess 35–50 min

Unit 2 Assessment

Assessment Handbook, pp. 15–18

WHOLE CLASS | SMALL GROUP | PARTNER | **INDEPENDENT**

Students complete the Unit 2 Assessment to demonstrate their progress on the standards covered in this unit.

Generic rubrics in the *Assessment Handbook* can be used to evaluate student progress on the Mathematical Process and Practice Standards.

NAME DATE TIME **Lesson 2-14**

Unit 2 Assessment (continued)

4. Complete the table.

Standard Notation	Products of 10s	Exponential Notation
1,000	10 * 10 * 10	10^3
100,000	10 * 10 * 10 * 10 * 10	10^5
100	10 * 10	10^2
1,000,000	10 * 10 * 10 * 10 * 10 * 10	10^6

5. **a.** Jamella and Ilyssa were playing *High-Number Toss*. They created the numbers shown below. Write each player's number in standard notation. Circle the player who won the round.
   Jamella: $624 * 10^4$ Standard notation: 6,240,000
   (Ilyssa) $155 * 10^5$ Standard notation: 15,500,000

   b. Explain how you wrote each number in standard notation. Sample answer: I just needed to attach zeros to the end of each number. The exponent tells me the number of zeros to attach.

6. Write the number 2,574,068 in expanded form.
   Sample answer: (2 * 1,000,000) + (5 * 100,000) + (7 * 10,000) + (4 * 1,000) + (6 * 10) + (8 * 1)

7. Convert pounds to ounces to complete the table.

pounds	ounces
1	16
2	32
5	80
8	128
10	160

16 *Assessment Handbook*

Assessment Handbook, p. 16

Differentiate Adjusting the Assessment

Item(s)	Adjustments
1, 2	To scaffold Items 1 and 2, have students use a place-value chart.
3	To extend Item 3, have students explain whether they overestimated or underestimated the actual number of cans Jesse has.
4	To scaffold Item 4, have students use calculators to check that the product of 10s is correct.
5	To extend Item 5, have students write numbers that would beat both Jamella and Ilyssa in *High-Number Toss*.
6	To extend Item 6, have students write the number in expanded form in a different way.
7	To scaffold Item 7, have students use words to describe the relationship between pounds and ounces. Record the relationship with an expression and have students evaluate the expression to fill in the remaining rows.
8	To scaffold Item 8, have students use the table in Item 7 to figure out the number of ounces in 4 pounds. Then have them find the total weight of the package.
9	To extend Item 9, have students write and solve another number story in which they have to interpret the remainder.
10, 11	To extend Items 10 and 11, have students solve the problems using both partial-products multiplication and U.S. traditional multiplication and compare the methods.
12, 13	To scaffold Items 12 and 13, provide copies of *Math Masters*, page TA10, and have students write lists of multiples for the divisors.

Advice for Differentiation

Because this is the beginning of the school year, all of the content included on the Unit 2 Assessment was recently introduced and will be revisited in subsequent units.

Go Online:

Quick Entry Evaluation Record children's progress and to see trajectories toward mastery for these standards.

Data Review your children's progress reports. Differentiation materials are available online to help you address children's needs.

NOTE See the Unit Organizer on pages 104–105 or the online Spiral Tracker for details on Unit 2 focus topics and the spiral.

Assessment Handbook, p. 17

NAME DATE TIME Lesson 2-14

Unit 2 Assessment (continued)

8 Write an expression with grouping symbols to model the number story. Then solve.

Allen is shipping a gift to his cousin. The gift weighs 4 pounds. The box and shipping materials weigh 9 ounces. What is the total weight of the package in ounces?

Number model: $(4 * 16) + 9$

Answer: 73 ounces

9 Create a mathematical model for the problem. Then solve the problem and show your work. Explain how you decided what to do with the remainder.

Jamie is helping out in the school library. He needs to figure out how many shelves the library staff should order for a new reading corner. There are 378 books for the reading corner. Each shelf holds 50 books. The librarian wants to put all the books on shelves. How many shelves should the library order?

Sample model:

50 books | 50 books | 50 books | 50 books
50 books | 50 books | 50 books | + 28 more books

Quotient: 7 Remainder: 28

What does the remainder represent? 28 additional books that need to go on a shelf

Answer: The library should order 8 shelves.

Circle what you did with the remainder: Ignored it (Rounded the quotient up)

Why? Sample answer: The library wants shelves for all the books, so they need a shelf for the 28 extra books.

Assessment Masters 17

Assessment Handbook, p. 18

NAME DATE TIME Lesson 2-14

Unit 2 Assessment (continued)

Make an estimate for each problem. Then solve. Use U.S. traditional multiplication for Problems 10 and 11. Use your estimate to check whether your answer makes sense.

10 $364 * 9 = ?$ Sample answer:
Estimate: $364 * 10 = 3{,}640$

$$\begin{array}{r} 5\ 3 \\ 3\ 6\ 4 \\ \times\quad 9 \\ \hline 3,\ 2\ 7\ 6 \end{array}$$

11 $48 * 13 = ?$ Sample answer:
Estimate: $50 * 10 = 500$

$$\begin{array}{r} 2 \\ 4\ 8 \\ \times\ 1\ 3 \\ \hline 1\ 4\ 4 \\ +\ 4\ 8\ 0 \\ \hline 6\ 2\ 4 \end{array}$$

12 $806 \div 4 \rightarrow ?$ Sample answer:
Estimate: $800 \div 4 = 200$

$806 \div 4 \rightarrow 201$ R 2

13 $962 \div 25 \rightarrow ?$ Sample answer:
Estimate: $1{,}000 \div 25 = 40$

$962 \div 25 \rightarrow 38$ R 12

18 *Assessment Handbook*

Assessment Handbook, p. 19

NAME DATE TIME **Lesson 2-14**

Unit 2 Challenge

① **a.** Use the following expressions to complete the statements below.

$6 * 10^8$ $68 * 10^3$ $16 * 10^5$ $5 * 10^7$

In 1 year Earth travels about $6 * 10^8$ miles in its orbit around the Sun.

In 1 month Earth travels about $5 * 10^7$ miles.

In 1 day Earth travels about $16 * 10^5$ miles.

In 1 hour Earth travels about $68 * 10^3$ miles.

b. Evaluate each of the expressions.

$6 * 10^8 =$ 600,000,000

$68 * 10^3 =$ 68,000

$16 * 10^5 =$ 1,600,000

$5 * 10^7 =$ 50,000,000

c. Do your answers to Part a make sense? How do you know? Sample answer: Yes. Earth travels fewer miles in less time. When I evaluated the expressions, I saw that I had put them in order from longest to shortest in Part a.

② Sally and Paul solved the same multiplication problem. Sally used U.S. traditional multiplication. Paul used a different strategy.

Sally	Paul
101 * 26 = ?	101 * 26 = ?
1 0 1 * 2 6 6 0 6 + 2, 0 2 0 2, 6 2 6	100 * 26 = 2,600 1 * 26 = 26 2,600 + 26 = 2,626

Which strategy seems more efficient? Why?

Sample answer: Paul's strategy seems more efficient because I can do all his steps in my head.

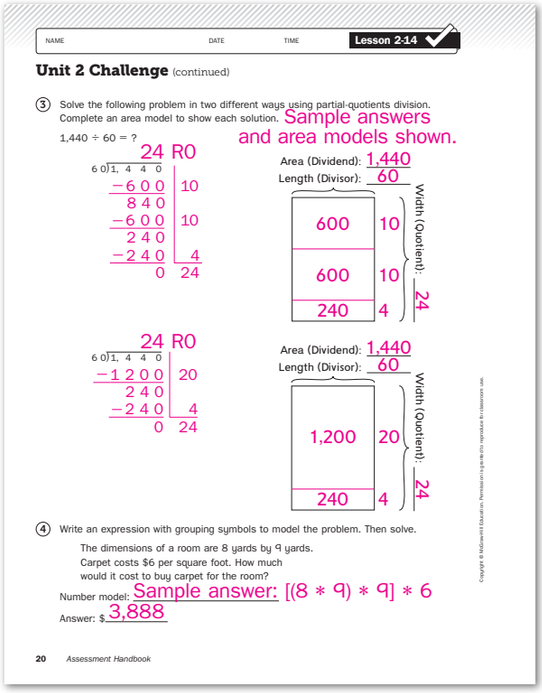
Assessment Masters 19

Unit 2 Challenge (Optional)

Assessment Handbook, pp. 19–20

WHOLE CLASS | SMALL GROUP | PARTNER | **INDEPENDENT**

Students can complete the Unit 2 Challenge after they complete the Unit 2 Assessment.



NAME DATE TIME **Lesson 2-14**

Unit 2 Challenge (continued)

③ Solve the following problem in two different ways using partial-quotients division. Complete an area model to show each solution. Sample answers and area models shown.

1,440 ÷ 60 = ?

```
          24 R0
60 ) 1, 4 4 0
     −6 0 0   10
      8 4 0
     −6 0 0   10
      2 4 0
     −2 4 0    4
          0   24
```

Area (Dividend): 1,440
Length (Divisor): 60

600	10
600	10
240	4

Width (Quotient): 24

```
          24 R0
60 ) 1, 4 4 0
     −1 2 0 0  20
      2 4 0
     −2 4 0    4
          0   24
```

Area (Dividend): 1,440
Length (Divisor): 60

1,200	20
240	4

Width (Quotient): 24

④ Write an expression with grouping symbols to model the problem. Then solve.

The dimensions of a room are 8 yards by 9 yards. Carpet costs $6 per square foot. How much would it cost to buy carpet for the room?

Number model: Sample answer: [(8 * 9) * 9] * 6

Answer: $ 3,888

20 *Assessment Handbook*

Assessment Handbook, p. 20

Unit 2 Progress Check

Overview **Day 2:** Administer the Cumulative Assessment.

Day 2: Cumulative Assessment

2b Assess 35–45 min

Materials

Cumulative Assessment
These items reflect mastery expectations to this point.

Assessment Handbook, pp. 21–22

Standards	Goals for Mathematical Content (GMC)	Cumulative Assessment
5.OA.1	Write numerical expressions that contain grouping symbols.	1–4
5.OA.2	Interpret numerical expressions without evaluating them.	5a, 5b
5.MD.1	Convert among measurement units within the same system.	9b
	Use measurement conversions to solve multi-step, real-world problems.	9b
5.MD.3, 5.MD.3a	Understand that a unit cube has 1 cubic unit of volume and can measure volume.	7
5.MD.3, 5.MD.3b	Understand that a solid figure completely filled by ***n*** unit cubes has volume ***n*** cubic units.	6a, 6b, 7
5.MD.4	Measure volumes by counting unit cubes and improvised units.	6a, 6b
5.MD.5, 5.MD.5a	Represent products of three whole numbers as volumes.	8
5.MD.5, 5.MD.5b	Apply formulas to find volumes of rectangular prisms.	8, 9a
5.MD.5, 5.MD.5c	Find volumes of figures composed of right rectangular prisms.	9a
	Solve real-world problems involving volumes of figures composed of prisms.	9a
	Goals for Mathematical Process and Practice (GMP)	
SMP1	Make sense of your problem. GMP1.1	5b, 8, 9c
SMP2	Make sense of the representations you and others use. GMP2.2	6a, 6b
SMP6	Explain your mathematical thinking clearly and precisely. GMP6.1	5b, 6b, 7
	Think about accuracy and efficiency when you count, measure, and calculate. GMP6.4	5b

3 Look Ahead 10–15 min

Materials

Math Boxes 2-14: Preview for Unit 3
Students preview skills and concepts for Unit 3.

Math Journal 1, p. 70

Home Link 2-14
Students take home the Family Letter that introduces Unit 3.

Math Masters, pp. 73–76

Go Online to see how mastery develops for all standards within the grade.

Assessment Handbook, p. 21

NAME DATE TIME **Lesson 2-14**

Unit 2 Cumulative Assessment

For Problems 1–4, insert grouping symbols to make the number sentences true.

① 160 ÷ (16 + 4) = 8 ② (4 + 6) * 8 ÷ 2 = 40

③ 3 = 120 ÷ (64 − 24) ④ 135 = (42 + 3) * 3

⑤ **a.** Write each expression in the correct column.

2 * (12 + 4) 12 + 4 − 4 (12 + 4) ÷ 8

6 + 12 + 4 (12 + 4) * 10 (12 + 4) − 10

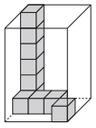
> (12 + 4)	< (12 + 4)
2 * (12 + 4)	12 + 4 − 4
6 + 12 + 4	(12 + 4) ÷ 8
(12 + 4) * 10	(12 + 4) − 10

b. Did you need to evaluate the expressions to solve Problem 5a? Why or why not?

Sample answer: No. Every expression had 12 + 4 in it. I just had to decide whether (12 + 4) was getting larger or smaller in each expression.

⑥ **a.** Find the volume of the prism.

Volume = 72 cubic units



b. Explain how you found the volume of the prism.

Sample answer: I filled in the rest of the base with cubes and saw that it would be 12. The height is 6. 12 * 6 = 72 cubes.

Assessment Masters 21

Assessment Handbook, p. 22

NAME DATE TIME **Lesson 2-14**

Unit 2 Cumulative Assessment (continued)

⑦ Why is a unit cube a good unit for measuring volume?

Sample answers: Cubes fit into corners and pack neatly. A unit cube has a volume of 1 cubic unit, so you count the cubes that fit into a prism to find the volume.

⑧ Damien is buying boxes from a moving company. He wants to buy the box that will fit the most of his belongings. He can choose between the following three options:

Box 1: 

Box 2: 

Box 3: 

What is the volume of each box? Write a number sentence that shows how you found the volume. *Remember:* $V = l \times w \times h$ and $V = B \times h$

Volume of Box 1: 18 ft³ Number sentence: 3 * 2 * 3 = 18

Volume of Box 2: 27 ft³ Number sentence: 9 * 3 = 27

Volume of Box 3: 24 ft³ Number sentence: 4 * 3 * 2 = 24

Which box should Damien buy? Explain your answer. Sample answer: He should buy Box 2 because it has the largest volume.

⑨ Josh's family is renting a storage unit. The storage facility gave Josh's family this sketch of a storage unit.

a. What is the volume of the storage unit? 180 ft³

b. Josh's family estimated that they need a unit with a volume of 10 cubic yards. How many cubic feet of storage space do they need? *Hint:* There are 3 feet in 1 yard.

Josh's family needs 270 ft³ of storage space.

c. Is the storage unit large enough for Josh's family? Explain why or why not.

No. Sample explanation: Josh's family needs a unit with about 270 cubic feet. This unit has only 180 cubic feet of volume.

22 *Assessment Handbook*

2b Assess 35–45 min

Cumulative Assessment

Assessment Handbook, pp. 21–22

WHOLE CLASS | SMALL GROUP | PARTNER | **INDEPENDENT**

Students complete the Cumulative Assessment. The problems in the Cumulative Assessment address content from Unit 1. It can help you monitor learning and retention of some (but not all) of the content and process/practice standards that were the focus of that unit, as detailed in the Cumulative Assessment table on page 203. Successful responses to these problems indicate adequate progress at this point in the year.

Monitor student progress on the standards using the online assessment and reporting tools.

Generic rubrics in the *Assessment Handbook* can be used to evaluate student progress on the Mathematical Process and Practice Standards.

Written assessments are one way students can demonstrate what they know. The table below shows adjustments you can make to the Cumulative Assessment to maximize opportunities for individual students or for your entire class.

Differentiate **Adjusting the Assessment**

Item(s)	Adjusting the Assessment
1–4	To scaffold Items 1–4, provide students with several examples of where grouping symbols could be placed and have them choose the correct answer from the examples.
5	To extend Item 5, have students write additional expressions that could be placed in each column of the table.
6	To scaffold Item 6, provide students with unit cubes and allow them to build the rectangular prism shown.
7	To scaffold Item 7, give students pattern blocks and a prism. Ask them to pack the prism with different pattern blocks and compare them to cubes.
8	To scaffold Item 8, remind students what each of the variables represents in the formulas $V = l * w * h$ and $V = B * h$.
9	To extend Item 9, ask students to sketch a storage unit that would be large enough to fit the family's belongings.

Advice for Differentiation

Because this is the beginning of the school year, all of the content included on the Cumulative Assessment was recently introduced and will be revisited in subsequent units.

Go Online:

Quick Entry Evaluation Record children's progress and to see trajectories toward mastery for these standards.

Data Review your children's progress reports. Differentiation materials are available online to help you address children's needs.

3 Look Ahead 10–15 min

▸ Math Boxes 2-14: Preview for Unit 3

Math Journal 1, p. 70

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

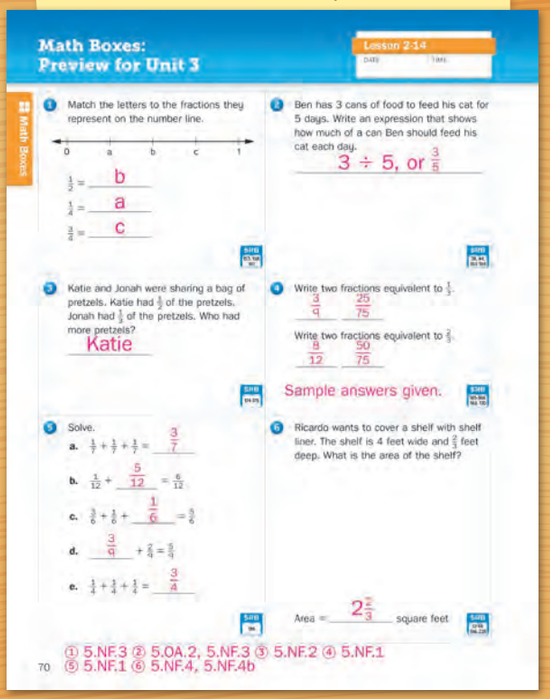
Mixed Practice Math Boxes 2-14 are paired with Math Boxes 2-10. These problems focus on skills and understandings that are prerequisite for Unit 3. You may want to use information from these Math Boxes to plan instruction and grouping in Unit 3.

▸ Home Link 2-14: Unit 3 Family Letter

Math Masters, pp. 73–76

Home Connection The Unit 3 Family Letter provides information and activities related to Unit 3 content.

Math Journal 1, p. 70


Math Boxes: Preview for Unit 3

Lesson 2-14

Math Boxes

1. Match the letters to the fractions they represent on the number line.

0 a b c 1

$\frac{1}{2}$ = b

$\frac{1}{4}$ = a

$\frac{3}{4}$ = c

2. Ben has 3 cans of food to feed his cat for 5 days. Write an expression that shows how much of a can Ben should feed his cat each day.

3 ÷ 5, or $\frac{3}{5}$

3. Katie and Jonah were sharing a bag of pretzels. Katie had $\frac{3}{9}$ of the pretzels. Jonah had $\frac{1}{3}$ of the pretzels. Who had more pretzels?

Katie

4. Write two fractions equivalent to $\frac{1}{3}$.

$\frac{3}{9}$ $\frac{25}{75}$

Write two fractions equivalent to $\frac{2}{3}$.

$\frac{8}{12}$ $\frac{50}{75}$

Sample answers given.

5. Solve.

a. $\frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{3}{7}$

b. $\frac{1}{12} + \frac{5}{12} = \frac{6}{12}$

c. $\frac{3}{6} + \frac{1}{6} + \frac{1}{6} = \frac{5}{6}$

d. $\frac{3}{9} + \frac{2}{9} = \frac{5}{9}$

e. $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

6. Ricardo wants to cover a shelf with shelf liner. The shelf is 4 feet wide and $\frac{2}{3}$ feet deep. What is the area of the shelf?

Area = $2\frac{2}{3}$ square feet

① 5.NF.3 ② 5.OA.2, 5.NF.3 ③ 5.NF.2 ④ 5.NF.1 ⑤ 5.NF.1 ⑥ 5.NF.4, 5.NF.4b

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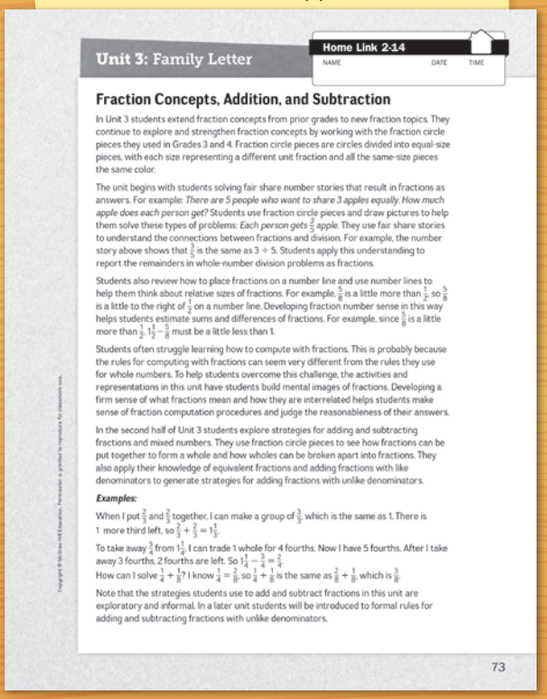
Math Masters, pp. 73–76


Unit 3: Family Letter

Home Link 2-14

NAME DATE TIME

Fraction Concepts, Addition, and Subtraction

In Unit 3 students extend fraction concepts from prior grades to new fraction topics. They continue to explore and strengthen fraction concepts by working with the fraction circle pieces they used in Grades 3 and 4. Fraction circle pieces are circles divided into equal-size pieces, with each size representing a different unit fraction and all the same-size pieces the same color.

The unit begins with students solving fair share number stories that result in fractions as answers. For example: *There are 5 people who want to share 3 apples equally. How much apple does each person get?* Students use fraction circle pieces and draw pictures to help them solve these types of problems: *Each person gets $\frac{3}{5}$ apple.* They use fair share stories to understand the connections between fractions and division. For example, the number story above shows that $\frac{3}{5}$ is the same as 3 ÷ 5. Students apply this understanding to report the remainders in whole-number division problems as fractions.

Students also review how to place fractions on a number line and use number lines to help them think about relative sizes of fractions. For example, $\frac{5}{8}$ is a little more than $\frac{1}{2}$, so $\frac{5}{8}$ is a little to the right of $\frac{1}{2}$ on a number line. Developing fraction number sense in this way helps students estimate sums and differences of fractions. For example, since $\frac{5}{8}$ is a little more than $\frac{1}{2}$, $1\frac{1}{2} - \frac{5}{8}$ must be a little less than 1.

Students often struggle learning how to compute with fractions. This is probably because the rules for computing with fractions can seem very different from the rules they use for whole numbers. To help students overcome this challenge, the activities and representations in this unit have students build mental images of fractions. Developing a firm sense of what fractions mean and how they are interrelated helps students make sense of fraction computation procedures and judge the reasonableness of their answers.

In the second half of Unit 3 students explore strategies for adding and subtracting fractions and mixed numbers. They use fraction circle pieces to see how fractions can be put together to form a whole and how wholes can be broken apart into fractions. They also apply their knowledge of equivalent fractions and adding fractions with like denominators to generate strategies for adding fractions with unlike denominators.

Examples:

When I put $\frac{2}{3}$ and $\frac{2}{3}$ together, I can make a group of $\frac{3}{3}$, which is the same as 1. There is 1 more third left, so $\frac{2}{3} + \frac{2}{3} = 1\frac{1}{3}$.

To take away $\frac{3}{4}$ from $1\frac{1}{4}$, I can trade 1 whole for 4 fourths. Now I have 5 fourths. After I take away 3 fourths, 2 fourths are left. So $1\frac{1}{4} - \frac{3}{4} = \frac{2}{4}$.

How can I solve $\frac{1}{4} + \frac{1}{8}$? I know $\frac{1}{4} = \frac{2}{8}$, so $\frac{1}{4} + \frac{1}{8}$ is the same as $\frac{2}{8} + \frac{1}{8}$, which is $\frac{3}{8}$.

Note that the strategies students use to add and subtract fractions in this unit are exploratory and informal. In a later unit students will be introduced to formal rules for adding and subtracting fractions with unlike denominators.

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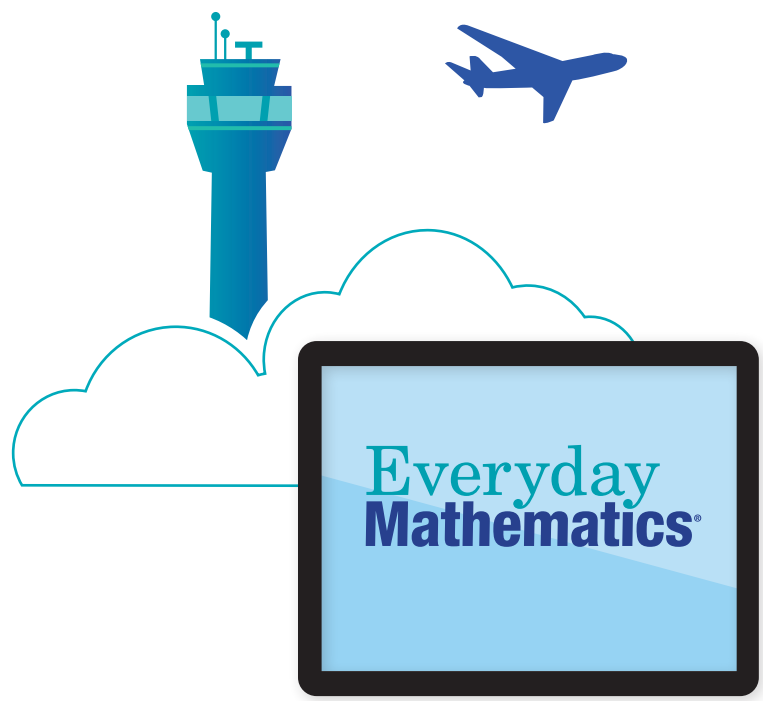
GRADE

5



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