Everyday Mathematics®
GRADE 5
The University of Chicago School Mathematics Project

REVIEWER’S GUIDE & LESSON SAMPLER
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 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**
- Assessment ............................................................ xvi
- Differentiation ......................................................... xviii
- Educational Equity .................................................. v
- Focus, Coherence, and Rigor ..................................... vi
- Lesson Structure ......................................................... xii
- Mastery ................................................................. xxx
- Online Resources ...................................................... xiv
- Practice ................................................................. viii
- Rich Mathematics Instruction ................................... xx

**Content**
- Lesson Types ......................................................... xxiii
- Lesson Parts and Features ........................................ xxiv
- Standards Correlations ............................................ xxxii
- Grade 5 Lessons (Table of Contents) ...................... lii
- Sample Unit Organizer ............................................. 98
- Sample Lesson ...................................................... 140
- Sample Open Response and Reengagement Lesson .... 160
- Sample Progress Check Lesson ............................. 198
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.
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.

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

**Warm Up**

- **Mental Math and Fluency**
  Students convert between units of length.

**Focus**

- **Math Message**
  Student Reference Book p. 338

**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.
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.

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.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Links to the Past</th>
<th>Links to the Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.OA.1</td>
<td>In Unit 1, students reviewed how to use grouping symbols in expressions and how to evaluate expressions with grouping symbols.</td>
<td>In Unit 7, students will use grouping symbols in an expression to model situations which require more than two operations are involved.</td>
</tr>
<tr>
<td>5.OA.2</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Conceptual Understanding</th>
<th>Procedural Skill and Fluency</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding (10^n)</td>
<td>Home Link 2-1: p. 115</td>
<td>Home Link 2-2: p. 115</td>
</tr>
<tr>
<td>Exponents and Powers of (10)</td>
<td>Journal: p. 44, 41</td>
<td>Introducing Powers of (10) p. 119</td>
</tr>
</tbody>
</table>

About Everyday Mathematics
Problem-based Instruction

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

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

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.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>K</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instruction builds on student curiosity about patterns to explore numbers, shapes, and relationships between them.</td>
<td>Students work with symbolic representations for quantities and relationships, model simple situations, and build arithmetic skills.</td>
<td>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.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

“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.
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.

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.

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.

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.

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.

Launch Presentation
Editable versions of digital lessons that help you lead instruction.
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.

Geometry’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.

Everyday Mathematics in Your Classroom
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.

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.

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.
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.
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

- **Content**: Clear goals and features that can be readily adapted or scaffolded to adjust the content for individual students.
- **Process**: Engaging activities and point-of-use prompts that help foster rich pedagogical interaction in the classroom.
- **Product**: Multiple opportunities to assess and monitor progress over time and to analyze mathematical strengths and misconceptions.
- **Classroom Organization**: Opportunities for whole-class and small-group instruction built into every lesson, as well as time for students to work in partners, and individually.
- **Learning Environment**: *Everyday Mathematics* provides multiple opportunities for students to reflect on their own strengths and weaknesses while engaging in productive collaboration.
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.
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 each unit.

### Preparing

EveryUnit Organizer also includes important background information on both content and practice standards to help you effectively deliver instruction.

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**EVERYDAY MATHEMATICS IN YOUR CLASSROOM**

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**Everyday Mathematics** includes a wealth of resources to help you deliver effective instruction every day.
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*. See the Materials section on pages xxv-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.

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 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.

<table>
<thead>
<tr>
<th>Lesson Parts and Features</th>
<th>Description</th>
<th>Tips</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson Opener</td>
<td>An outline of the lesson to assist in your planning that includes information on content and standards, timing suggestions, assessment, and materials.</td>
<td>• See Before You Begin for preparation tips. • Follow the time allotments for each part of the lesson.</td>
</tr>
<tr>
<td>Differentiation Options</td>
<td>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.</td>
<td>• 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.</td>
</tr>
<tr>
<td><strong>Part 1: Warm Up</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Math and Fluency</td>
<td>Quick, leveled warm-up exercises students answer orally, with gestures, or on slates or tablets that provide practice towards fluency.</td>
<td>• Select the levels that make sense for your students and customize for your class. • Spend 5 or fewer minutes on this feature.</td>
</tr>
<tr>
<td><strong>Part 2: Focus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Message and Math Message Follow-Up</td>
<td>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.</td>
<td>• 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.</td>
</tr>
</tbody>
</table>
### Part 2: Focus, con’t.

<table>
<thead>
<tr>
<th><strong>Instruction</strong></th>
<th><strong>Description</strong></th>
<th><strong>Tips</strong></th>
</tr>
</thead>
</table>
| **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.  
[Go Online](#) 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.  

### Part 3: Practice

<table>
<thead>
<tr>
<th><strong>Instruction</strong></th>
<th><strong>Description</strong></th>
<th><strong>Tips</strong></th>
</tr>
</thead>
</table>
| **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* 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.  
Encourage students to do these activities with someone at home, such as a parent, caregiver, or sibling. |
| **Home Link** | A daily homework page that provides practice and informs families about the math from that day’s lesson. | |

### Differentiation and Language Features

<table>
<thead>
<tr>
<th><strong>Description and Purpose</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjusting the Activity</strong></td>
</tr>
<tr>
<td><strong>Common Misconception</strong></td>
</tr>
<tr>
<td><strong>Game Modifications</strong></td>
</tr>
<tr>
<td><strong>Differentiation Support</strong></td>
</tr>
<tr>
<td><strong>Academic Language Development</strong></td>
</tr>
<tr>
<td><strong>English Language Learners (ELL)</strong></td>
</tr>
</tbody>
</table>
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

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

---

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 (con't)

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment Handbook</strong></td>
<td>• Assessment masters for unit-based assessments and interim assessments&lt;br&gt;• Record sheets for tracking individual and class progress</td>
</tr>
<tr>
<td><strong>Assessment and Reporting Tools</strong></td>
<td>• Student, class, school, and district reports&lt;br&gt;• Data available at point-of-use in the planning and teaching materials&lt;br&gt;• Real-time data to inform instruction and differentiation</td>
</tr>
<tr>
<td><strong>Spiral Tracker</strong></td>
<td>• Online tool that helps you understand how standards develop across the spiral curriculum</td>
</tr>
</tbody>
</table>

### Professional Development

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implementation Guide</strong></td>
<td>• Online resource with information on implementing the curriculum</td>
</tr>
<tr>
<td><strong>Virtual Learning Community</strong></td>
<td>• 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&lt;br&gt;• A collection of resources including videos of teachers implementing lessons in real classrooms, photos, work samples, and planning tools</td>
</tr>
</tbody>
</table>

### Family Communications

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home Connection Handbook</strong></td>
<td>• A collections of tips and tools to help you communicate to families about <em>Everyday Mathematics</em>&lt;br&gt;• Reproducible masters for home communication for use by both teachers and administrators</td>
</tr>
</tbody>
</table>
# Student Materials

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

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

<table>
<thead>
<tr>
<th>Strand</th>
<th>S.0A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster</td>
<td>Write and interpret numerical expressions.</td>
</tr>
<tr>
<td>S.0A.1</td>
<td>Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</td>
</tr>
<tr>
<td>Everyday Mathematics</td>
<td>Write numerical expressions that contain grouping symbols.</td>
</tr>
<tr>
<td>Goals for Mathematical Content</td>
<td>Evaluate expressions that contain grouping symbols.</td>
</tr>
</tbody>
</table>

| Cluster                 | 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. |
| S.0A.2                  | Model real-world and mathematical situations using simple expressions. |
| Everyday Mathematics    | Interpret numerical expressions without evaluating them.             |

| Cluster                 | Analyze patterns and relationships.                                   |
| S.0A.3                  | Generate two numerical patterns using 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. |
| Everyday Mathematics    | Generate numerical patterns using given rules.                        |
| Goals for Mathematical Content | Identify relationships between corresponding terms of two patterns. |
|                        | Form ordered pairs from corresponding terms of patterns and graph them |

### Goals for Mathematical Practice

The authors created Goals for Mathematical Practice (GMP) that unpack the practice standards, operationalizing 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

<table>
<thead>
<tr>
<th>1 Make sense of problems and persevere in solving them.</th>
<th>Everyday Mathematics Goals for Mathematical Process and Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 by 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 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, &quot;Does this make sense?&quot; They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.</td>
<td>GMP1.1 Make sense of your problem</td>
</tr>
<tr>
<td>GMP1.2 Reflect on your thinking as you solve your problem.</td>
<td>GMP1.3 Keep trying when your problem is hard.</td>
</tr>
<tr>
<td>GMP1.4 Check whether your answer makes sense.</td>
<td>GMP1.5 Solve problems in more than one way.</td>
</tr>
<tr>
<td>GMP1.6 Compare the strategies you and others use.</td>
<td>GMP1.7 Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs, and concrete objects.</td>
</tr>
</tbody>
</table>

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
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 xi provide a full picture of how every standard develops across the entire grade.
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

#### Operations and Algebraic Thinking  5.OA

**Write and interpret numerical expressions.**

<table>
<thead>
<tr>
<th>5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</th>
<th>1-1, 1-5, 1-9, 1-11, 2-3, 2-5, 2-6, 2-8, 2-10, 3-6, 6-13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(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)</td>
</tr>
</tbody>
</table>

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

| 4-9, 5-6, 7-10, 7-11, 7-12, 7-13, 8-2, 8-9 |
| --- | --- |
|  | (6-10, 8-6, 8-10, 8-12) |

**Analyze patterns and relationships.**

<table>
<thead>
<tr>
<th>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.</th>
<th></th>
<th>4-1, 1-5, 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</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1-2, 1-3, 1-4, 1-6, 1-8, 1-10, 2-2, 3-1, 3-4, 3-9, 3-10, 3-11, 3-13, 3-14)</td>
<td></td>
</tr>
</tbody>
</table>

#### 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, 8-9, 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

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).

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.

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

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.

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.

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.

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.)

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.

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

5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
Content Standards for Mathematics for Grade 5

**5.NF.4a** Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ 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 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** Interpret multiplication as scaling (resizing), by:

- 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 × a)/(n × b) to the effect of multiplying a/b by 1.

- 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.

- 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 × a)/(n × b) to the effect of multiplying a/b by 1.

**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.

**5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.¹

- 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.

- Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/9), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/9) = 36 because 20 × (1/9) = 4.

- 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?²

**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.

- 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.

¹Students 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

**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.**

```
<table>
<thead>
<tr>
<th>Everyday Mathematics Grade 5 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-4, 6-5, 6-13, 7-1, 7-9, 8-8</td>
</tr>
<tr>
<td>(6-11, 7-6, 7-8, 8-2, 8-4)</td>
</tr>
</tbody>
</table>
```

**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.**

```
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.

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.

5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

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

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.

5.MD.5b Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

5.MD.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.
```

**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).**

```
<table>
<thead>
<tr>
<th>Everyday Mathematics Grade 5 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
</tr>
<tr>
<td>(4-13, 5-1, 5-3, 5-11, 6-2, 6-4, 6-11, 6-13, 7-2, 7-4, 8-6)</td>
</tr>
</tbody>
</table>
```

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.**

```
<table>
<thead>
<tr>
<th>Everyday Mathematics Grade 5 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
</tr>
<tr>
<td>(3-10, 5-11, 6-2, 6-4, 6-11, 6-13, 7-2, 7-4, 8-6)</td>
</tr>
</tbody>
</table>
```

**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.**

```
<table>
<thead>
<tr>
<th>Everyday Mathematics Grade 5 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1, 7-5, 7-6, 7-7, 7-8, 7-9, 8-3, 8-8, 8-11, 8-12</td>
</tr>
<tr>
<td>(7-12, 8-6, 8-10)</td>
</tr>
</tbody>
</table>
```

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

```
<table>
<thead>
<tr>
<th>Everyday Mathematics Grade 5 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-5, 7-6, 7-7, 7-8, 7-9, 8-3, 8-8, 8-11, 8-12</td>
</tr>
<tr>
<td>(6-10, 8-10)</td>
</tr>
</tbody>
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Pathway to Mastery
# 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

<table>
<thead>
<tr>
<th>Mathematical Processes and Practices</th>
<th>Everyday Mathematics Goals for Mathematical Processes and Practices</th>
</tr>
</thead>
</table>

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.
### Mathematical Processes and Practices

<table>
<thead>
<tr>
<th>3. Construct viable arguments and critique the reasoning of others.</th>
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</thead>
<tbody>
<tr>
<td>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.</td>
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</tbody>
</table>

### Everyday Mathematics Goals for Mathematical Processes and Practices


<table>
<thead>
<tr>
<th>4. Model with mathematics.</th>
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<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### 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.  

#### 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.

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### Mathematical Processes and Practices

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<tr>
<td>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 $7 \times 8$ 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 $2 \times 7$ 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 its value cannot be more than $5$ for any real numbers $x$ and $y$.</td>
<td>Pages 39, 41, 69, 81, 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, 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, 609, 619, 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</td>
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</table>

| 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 $\frac{(y - 2)}{(x - 1)} = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)x^2 + x^2 + x + 1$ 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.

<table>
<thead>
<tr>
<th>Standards</th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
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</thead>
<tbody>
<tr>
<td>5.OA.1</td>
<td>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.</td>
<td>Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</td>
<td>Ongoing practice and application.</td>
<td></td>
</tr>
<tr>
<td>5.OA.2</td>
<td>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.</td>
<td>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.</td>
<td>Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>Standards</td>
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<tr>
<td>5.OA.3</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>Form ordered pairs from data represented in a table and graph them.</td>
<td>★ 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 &quot;Add 3&quot; and the starting number 0, and given the rule &quot;Add 6&quot; 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.</td>
</tr>
<tr>
<td>5.NBT.1</td>
<td>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.</td>
<td>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.</td>
<td>★ Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and ( \frac{1}{10} ) of what it represents in the place to its left.</td>
<td>Ongoing practice and application.</td>
</tr>
</tbody>
</table>

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.
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<th>Standards</th>
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<th>Fourth Quarter Benchmark Expectations for Units 7 and 8</th>
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<tr>
<td>5.NBT.2</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
<td>★ 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.</td>
</tr>
<tr>
<td>5.NBT.3</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>★ Read, write, and compare decimals to thousandths.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.NBT.3a</td>
<td>No expectations for mastery at this point.</td>
<td>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).</td>
<td>★ 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).</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.NBT.3b</td>
<td>No expectations for mastery at this point.</td>
<td>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 &gt;, =, and &lt; symbols.</td>
<td>★ Compare two decimals to thousandths based on meanings of the digits in each place, using &gt;, =, and &lt; symbols to record the results of comparisons.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.NBT.4</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>★ Use place value understanding to round decimals to any place.</td>
<td>Ongoing practice and application.</td>
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<tr>
<td>Standards</td>
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<tr>
<td><strong>5.NBT.5</strong></td>
<td>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.</td>
<td>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 multiddigit by 2-digit multiplication problems in which only one digit in the second factor requires writing digits above the line. (For example, 636 * 17.)</td>
<td>★ Flently multiply multi-digit whole numbers using the standard algorithm.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>5.NBT.6</strong></td>
<td>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.</td>
<td>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.</td>
<td>★ 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.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>5.NBT.7</strong></td>
<td>No expectations for mastery at this point.</td>
<td>Use grids to add and subtract decimals. Use algorithms to add and subtract decimals through tenths with regrouping and through hundredths without regrouping.</td>
<td>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.</td>
<td>★ 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.</td>
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</table>

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.
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<tr>
<td>5.NF.1</td>
<td>No expectations of mastery at this point.</td>
<td>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.</td>
<td>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.</td>
<td>★ Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, ( \frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12} ). (In general, ( \frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd} ).)</td>
</tr>
<tr>
<td>5.NF.2</td>
<td>No expectations of mastery at this point.</td>
<td>Use tools or visual models to solve number stories involving addition and subtraction of fractions and mixed numbers with like denominators.</td>
<td>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.</td>
<td>★ 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 ( \frac{2}{5} + \frac{1}{2} = \frac{3}{7} ), by observing that ( \frac{3}{7} &lt; \frac{1}{2} ).</td>
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<tr>
<td>5.NF.3</td>
<td>No expectations of mastery at this point.</td>
<td>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.</td>
<td>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 ( \frac{3}{4} ) as the result of dividing ( 3 ) by ( 4 ), noting that ( \frac{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 ( \frac{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?</td>
<td>Ongoing practice and application.</td>
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| 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.
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<tr>
<td><strong>5.NF.4a</strong></td>
<td>No expectations of mastery at this point.</td>
<td>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.</td>
<td>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.</td>
<td>See the mastery expectation statements for the substandards (5.NF.4a and 5.NF.4b) for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.</td>
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<tr>
<td><strong>5.NF.4b</strong></td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
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<tr>
<td><strong>5.NF.5</strong></td>
<td>No expectations of mastery at this point. No expectations of mastery at this point. No expectations of mastery at this point.</td>
<td>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.</td>
<td>Interpret multiplication as scaling (resizing), by:</td>
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<tr>
<td>5.NF.5a</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>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.</td>
<td>★ 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.</td>
</tr>
<tr>
<td>5.NF.5b</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>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.</td>
<td>★ 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 ( \frac{a}{b} = \frac{(n \times a)}{(n \times b)} ) to the effect of multiplying ( \frac{a}{b} ) by 1.</td>
</tr>
<tr>
<td>5.NF.6</td>
<td>No expectations for mastery at this point.</td>
<td>Use tools and visual models to solve real-world fraction-of problems with unit fractions and whole numbers.</td>
<td>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.</td>
<td>★ Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</td>
</tr>
<tr>
<td>5.NF.7</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>★ Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Standards</th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.NF.7a</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>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).</td>
</tr>
<tr>
<td>5.NF.7b</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>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).</td>
</tr>
<tr>
<td>5.NF.7c</td>
<td>No expectation of mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>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?</td>
</tr>
<tr>
<td>5.MD.1</td>
<td>Perform one-step unit conversions within the same measurement system. Use conversions to solve real-world problems when necessary conversions are identified.</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Standards</td>
<td>First Quarter</td>
<td>Second Quarter</td>
<td>Third Quarter</td>
<td>Fourth Quarter</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------</td>
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<td>-------------------------------------</td>
</tr>
<tr>
<td>5.MD.2</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>5.MD.3</td>
<td>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.)</td>
<td>⭐️ Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</td>
<td>Ongoing practice and application.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.MD.3a</td>
<td>Understand that cubes are a good unit with which to measure volume because all the edge lengths of a cube are the same.</td>
<td>⭐️ 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.</td>
<td>Ongoing practice and application.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.MD.3b</td>
<td>Use unit cubes to pack a solid figure without gaps or overlaps.</td>
<td>⭐️ 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.</td>
<td>Ongoing practice and application.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>5.MD.4</td>
<td>Find the volume of fully-packed and partially-packed right rectangular prisms by counting unit cubes.</td>
<td>⭐️ Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</td>
<td>Ongoing practice and application.</td>
<td>Ongoing practice and application.</td>
</tr>
</tbody>
</table>

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.

Pathway to Mastery xlii
<table>
<thead>
<tr>
<th>Standards</th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.MD.5</strong></td>
<td>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.</td>
<td>Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</td>
<td></td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>5.MD.5a</strong></td>
<td>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.</td>
<td>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.</td>
<td></td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>5.MD.5b</strong></td>
<td>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.</td>
<td>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.</td>
<td></td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>5.MD.5c</strong></td>
<td>Find volumes of figures composed of right rectangular prisms, when given volume formulas and a clearly labeled representation.</td>
<td>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.</td>
<td></td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>Standards</td>
<td>First Quarter Benchmark Expectations for Units 1 and 2</td>
<td>Second Quarter Benchmark Expectations for Units 3 and 4</td>
<td>Third Quarter Benchmark Expectations for Units 5 and 6</td>
<td>Fourth Quarter Benchmark Expectations for Units 7 and 8</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>5.G.1</td>
<td>No expectation of mastery at this point.</td>
<td>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.</td>
<td>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.</td>
<td>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).</td>
</tr>
<tr>
<td>5.G.2</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>5.G.3</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>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.</td>
</tr>
<tr>
<td>5.G.4</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>No expectations for mastery at this point.</td>
<td>Classify two-dimensional figures in a hierarchy based on properties.</td>
</tr>
</tbody>
</table>

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.
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.

Unit 1 Area and Volume

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Introduction to the Student Reference Book</td>
<td>14</td>
</tr>
<tr>
<td>1-2</td>
<td>Area of a Rectangle, Part 1</td>
<td>20</td>
</tr>
<tr>
<td>1-3</td>
<td>Open Response Quilt Area</td>
<td>26</td>
</tr>
<tr>
<td>1-4</td>
<td>Area of a Rectangle, Part 2</td>
<td>36</td>
</tr>
<tr>
<td>1-5</td>
<td>Introduction to Volume</td>
<td>42</td>
</tr>
<tr>
<td>1-6</td>
<td>Exploring Nonstandard Volume Units</td>
<td>48</td>
</tr>
<tr>
<td>1-7</td>
<td>Measuring Volume by Counting Cubes</td>
<td>54</td>
</tr>
<tr>
<td>1-8</td>
<td>Measuring Volume by Iterating Layers</td>
<td>60</td>
</tr>
<tr>
<td>1-9</td>
<td>Two Formulas for Volume</td>
<td>66</td>
</tr>
<tr>
<td>1-10</td>
<td>Visualizing Volume Units</td>
<td>72</td>
</tr>
<tr>
<td>1-11</td>
<td>Volume Explorations</td>
<td>78</td>
</tr>
<tr>
<td>1-12</td>
<td>Playing Prism Pile-Up</td>
<td>84</td>
</tr>
<tr>
<td>1-13</td>
<td>Assessment Unit 1 Progress Check</td>
<td>90</td>
</tr>
</tbody>
</table>
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

- 2.1  Understanding Place Value  .................................................. 110
- 2.2  Exponents and Powers of 10  .............................................. 116
- 2.3  Applying Powers of 10  ....................................................... 122
- 2.4  U.S. Traditional Multiplication, Part 1  ................................. 128
- 2.5  U.S. Traditional Multiplication, Part 2  ................................ 134
- 2.6  Application: Unit Conversions  ........................................... 140
- 2.7  U.S. Traditional Multiplication, Part 3  ................................ 146
- 2.8  U.S. Traditional Multiplication, Part 4  ................................ 154
- 2.9  Open Response  One Million Taps  ...................................... 160
- 2.10  A Mental Division Strategy  ............................................... 170
- 2.11  Reviewing Partial-Quotients Division  ............................... 176
- 2.12  Strategies for Choosing Partial Quotients  ......................... 184
- 2.13  Interpreting the Remainder  .............................................. 190
- 2.14  Assessment  Unit 2 Progress Check  .................................. 198

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

- 3.1  Connecting Fractions and Division, Part 1  ......................... 218
- 3.2  Connecting Fractions and Division, Part 2  ......................... 224
- 3.3  Application: Interpreting Remainders  ............................... 232
- 3.4  Fractions on a Number Line  ............................................. 238
- 3.5  Open Response  Game Strategies  ....................................... 246
- 3.6  Fraction Estimation with Number Sense  ........................... 256
- 3.7  Fraction Estimation with Benchmarks  .............................. 262
- 3.8  Renaming Fractions and Mixed Numbers  ....................... 268
- 3.9  Introduction to Adding and Subtracting Fractions and Mixed Numbers  ................................................. 274
- 3.10  Exploring Addition of Fractions with Unlike Denominators  ................................................................. 280
- 3.11  Playing Fraction Capture  .................................................. 286
- 3.12  Solving Fraction Number Stories  ..................................... 292
- 3.13  Fraction-Of Problems, Part 1  .......................................... 298
- 3.14  Fraction-Of Problems, Part 2  .......................................... 304
- 3.15  Assessment  Unit 3 Progress Check  .................................. 310
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 5**

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.
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**

- **6-1** Multiplying and Dividing Decimals by Powers of 10 ........................................ 554
- **6-2** Playing *Exponent Ball* .................................................................................. 562
- **6-3** Application: Converting Measurements in the Metric System .................. 568
- **6-4** Line Plots ....................................................................................................... 574
- **6-5** Working with Data in Line Plots .................................................................... 580
- **6-6** Applying Volume Concepts .......................................................................... 586
- **6-7** Measuring Volume by Displacement .......................................................... 592
- **6-8** Estimating Decimal Products and Quotients ................................................ 598
- **6-9** Multiplication of Decimals ............................................................................. 604
- **6-10** **Open Response** Fundraising ................................................................. 610
- **6-11** Division of Decimals by Whole Numbers .................................................. 620
- **6-12** Division of Decimals by Decimals ............................................................. 626
- **6-13** Application: Estimating Your Reaction Time ............................................. 632
- **6-14** **Assessment** Unit 6 Progress Check ......................................................... 638
**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.

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### Unit 7 | Multiplication of Mixed Numbers; Geometry; Graphs | 646

| 7.1 | Multiplication of Mixed Numbers, Part 1 | 658 |
| 7.2 | Multiplication of Mixed Numbers, Part 2 | 664 |
| 7.3 | Rectangles with Fractional Side Lengths | 672 |
| 7.4 | Using Common Denominators for Fraction Division | 678 |
| 7.5 | A Hierarchy of Triangles | 684 |
| 7.6 | A Hierarchy of Quadrilaterals | 692 |
| 7.7 | Playing Property Pandemonium | 700 |
| 7.8 | **Open Response** A Hierarchy of Polygons | 706 |
| 7.9 | Collecting and Using Fractional Data | 716 |
| 7.10 | Identifying and Visualizing Patterns | 722 |
| 7.11 | Rules, Tables, and Graphs, Part 1 | 728 |
| 7.12 | Rules, Tables, and Graphs, Part 2 | 734 |
| 7.13 | Old Faithful’s Next Eruption | 740 |
| 7.14 | **Assessment** Unit 7 Progress Check | 746 |
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

<table>
<thead>
<tr>
<th>Lesson and Overview</th>
<th>Page</th>
<th>Content Standards*</th>
<th>Processes and Practices*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1 Understanding Place Value</td>
<td>110</td>
<td>5.NBT.1</td>
<td>SMP2, SMP7</td>
</tr>
<tr>
<td>2-2 Exponents and Powers of 10</td>
<td>116</td>
<td>5.NBT.1, 5.NBT.2</td>
<td>SMP6, SMP7</td>
</tr>
<tr>
<td>2-3 Applying Powers of 10</td>
<td>122</td>
<td>5.NBT.2</td>
<td>SMP1, SMP6</td>
</tr>
<tr>
<td>2-4 U.S. Traditional Multiplication, Part 1</td>
<td>128</td>
<td>5.NBT.5</td>
<td>SMP1</td>
</tr>
<tr>
<td>2-5 U.S. Traditional Multiplication, Part 2</td>
<td>134</td>
<td>5.NBT.5</td>
<td>SMP1, SMP7</td>
</tr>
<tr>
<td>2-4 Application: Unit Conversions</td>
<td>140</td>
<td>5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1</td>
<td>SMP1, SMP4, SMP5</td>
</tr>
<tr>
<td>2-7 U.S. Traditional Multiplication, Part 3</td>
<td>146</td>
<td>5.OA.2, 5.NBT.5</td>
<td>SMP1, SMP2</td>
</tr>
<tr>
<td>2-8 U.S. Traditional Multiplication, Part 4</td>
<td>154</td>
<td>5.NBT.5</td>
<td>SMP1, SMP6</td>
</tr>
<tr>
<td>2-9 Open Response One Million Taps</td>
<td>160</td>
<td>5.NBT.2, 5.NBT.5</td>
<td>SMP1, SMP4, SMP6</td>
</tr>
<tr>
<td>2-10 A Mental Division Strategy</td>
<td>170</td>
<td>5.NBT.2, 5.NBT.6</td>
<td>SMP6, SMP7</td>
</tr>
<tr>
<td>2-11 Reviewing Partial-Quotients Division</td>
<td>176</td>
<td>5.NBT.6</td>
<td>SMP1, SMP2</td>
</tr>
<tr>
<td>2-12 Strategies for Choosing Partial Quotients</td>
<td>184</td>
<td>5.NBT.6</td>
<td>SMP1, SMP2, SMP6</td>
</tr>
<tr>
<td>2-13 Interpreting the Remainder</td>
<td>190</td>
<td>5.NBT.6</td>
<td>SMP1, SMP4</td>
</tr>
<tr>
<td>2-14 Assessment Unit 2 Progress Check</td>
<td>198</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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.

<table>
<thead>
<tr>
<th>Links to the Past</th>
<th>Links to the Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.OA.1</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.OA.2</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.NBT.1</td>
<td>In Grade 4, students worked with place-value concepts in whole numbers through 1,000,000.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.NBT.2</td>
<td>In Grade 4, students developed a rule for solving multiplication problems involving multiples of 10.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.NBT.5</td>
<td>In Grade 4, students used partial-products multiplication and lattice multiplication to solve multidigit multiplication problems.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.NBT.6</td>
<td>In Grade 4, students used partial-quotients division to solve division problems with 4-digit dividends and 1-digit divisors.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>5.MD.1</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>
# Planning for Rich Math Instruction

## 2-1 Understanding Place Value
- **Conceptual Understanding**
  - The relationship between places in multidigit numbers
    - Describing Place-Value Relationships, p. 112
    - Representing Place Value, p. 113

## 2-2 Exponents and Powers of 10
- **Exponential notation**
  - Introducing Powers of 10, p. 118

## 2-3 Applying Powers of 10
- **Estimation**
  - Estimating with Powers of 10, p. 125

## 2-4 U.S. Traditional Multiplication, Part 1
- **Multidigit multiplication**
  - Introducing U.S. Traditional Multiplication, p. 130

### Rigor

#### Conceptual Understanding
- Home Link 2-1, p. 115

#### Procedural Skill and Fluency
- Journal p. 44, #1
  - Using Powers of 10 to Multiply, p. 124
  - Readiness, p. 123
  - Extra Practice, p. 123

#### Applications
- Introducing Powers of 10, p. 118
  - Solving a Real-World Volume Problem, p. 121
  - Enrichment, p. 117

#### Rich Tasks and Mathematical Reasoning
- Journal p. 40: Writing/Reasoning
  - Enrichment, p. 111

#### Mathematical Discourse
- Representing Place Value, p. 113
  - Introducing Number Top-It, p. 114

#### Distributed Practice
- Mental Math and Fluency, p. 112
  - Finding Volumes of Rectangular Prisms, p. 115
  - Math Boxes 2-1, p. 115

#### 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
    - Academic Language Development, p. 125

- Differentiation Options, p. 129
  - ELL Support, p. 129
  - Online Differentiation Support 2-4
    - Common Misconception, p. 132
## Unit 2 Organizer

<table>
<thead>
<tr>
<th>2-5</th>
<th>U.S. Traditional Multiplication, Part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multidigit multiplication</strong></td>
<td>Extending U.S. Traditional Multiplication, p. 136</td>
</tr>
<tr>
<td><strong>Measurement conversions</strong></td>
<td>Converting Miles to Feet, p. 142</td>
</tr>
<tr>
<td><strong>Solving Unit Conversion Number Stories</strong>, p. 143</td>
<td><strong>Estimating and Multiplying</strong>, p. 152</td>
</tr>
<tr>
<td><strong>Home Link 2-5</strong>, p. 139</td>
<td><strong>Introducing Multiplication Bull’s Eye</strong>, p. 153</td>
</tr>
<tr>
<td><strong>Readiness</strong>, p. 135</td>
<td><strong>Home Link 2-7</strong>, p. 153</td>
</tr>
<tr>
<td><strong>Enrichment</strong>, p. 135</td>
<td><strong>Readiness</strong>, p. 147</td>
</tr>
<tr>
<td><strong>Extra Practice</strong>, p. 135</td>
<td><strong>Extra Practice</strong>, p. 147</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-6</th>
<th>Application: Unit Conversions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multidigit multiplication</strong></td>
<td>Extending U.S. Traditional Multiplication to Larger Numbers, p. 156</td>
</tr>
<tr>
<td><strong>Comparing Multiplication Methods</strong>, p. 151</td>
<td><strong>Choosing Multiplication Strategies</strong>, p. 158</td>
</tr>
<tr>
<td><strong>Extending U.S. Traditional Multiplication, p. 148</strong></td>
<td><strong>Choosing Multiplication Strategies</strong>, p. 158</td>
</tr>
<tr>
<td><strong>Comparing Multiplication Methods</strong>, p. 151</td>
<td><strong>Playing Name That Number</strong>, p. 159</td>
</tr>
<tr>
<td><strong>Home Link 2-8</strong>, p. 159</td>
<td><strong>Extra Practice</strong>, p. 155</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-7</th>
<th>U.S. Traditional Multiplication, Part 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applications</strong></td>
<td><strong>Distributed Practice</strong></td>
</tr>
<tr>
<td><strong>Math Message</strong>, p. 136</td>
<td><strong>Differentiation Support</strong></td>
</tr>
<tr>
<td><strong>Journal p. 51: Writing/Reasoning</strong></td>
<td><strong>Common Misconception</strong>, p. 157</td>
</tr>
<tr>
<td><strong>Enrichment</strong>, p. 135</td>
<td><strong>Differentiation Options</strong>, p. 135</td>
</tr>
<tr>
<td><strong>Making Unit Conversion Number Stories</strong>, p. 143</td>
<td><strong>ELL Support</strong>, p. 135</td>
</tr>
<tr>
<td><strong>Solving Unit Conversion Number Stories</strong>, p. 143</td>
<td><strong>Online Differentiation Support 2-5 Academic Language Development</strong>, p. 136</td>
</tr>
<tr>
<td><strong>Home Link 2-6</strong>, p. 145</td>
<td><strong>Adjusting the Activity</strong>, p. 137</td>
</tr>
<tr>
<td><strong>Enrichment</strong>, p. 147</td>
<td><strong>Common Misconception</strong>, p. 138</td>
</tr>
<tr>
<td><strong>Math Message</strong>, p. 148</td>
<td><strong>Differentiation Options</strong>, p. 141</td>
</tr>
<tr>
<td><strong>Readiness</strong>, p. 147</td>
<td><strong>Adjusting the Activity</strong>, p. 144</td>
</tr>
<tr>
<td><strong>Extra Practice</strong>, p. 147</td>
<td><strong>Differentiation Options</strong>, p. 147</td>
</tr>
<tr>
<td><strong>Math Boxes 2-8</strong>, p. 159</td>
<td><strong>Online Differentiation Support 2-7 Academic Language Development</strong>, p. 143</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-8</th>
<th>U.S. Traditional Multiplication, Part 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conceptual Understanding</strong></td>
<td><strong>Procedural Skill and Fluency</strong></td>
</tr>
<tr>
<td><strong>Mental Math and Fluency</strong>, p. 136</td>
<td><strong>Comparing Multiplication Methods</strong>, p. 151</td>
</tr>
<tr>
<td><strong>Extending U.S. Traditional Multiplication, p. 136</strong></td>
<td><strong>Choosing Multiplication Strategies</strong>, p. 158</td>
</tr>
<tr>
<td><strong>Introducing Multiplication Top-It: Larger Numbers, p. 138</strong></td>
<td><strong>Playing Name That Number</strong>, p. 159</td>
</tr>
<tr>
<td><strong>Home Link 2-5</strong>, p. 139</td>
<td><strong>Extra Practice</strong>, p. 155</td>
</tr>
<tr>
<td><strong>Readiness</strong>, p. 135</td>
<td><strong>Differentiation Options</strong>, p. 135</td>
</tr>
<tr>
<td><strong>Extra Practice</strong>, p. 135</td>
<td><strong>Adjusting the Activity</strong>, p. 137</td>
</tr>
<tr>
<td><strong>Practicing with Powers of 10, p. 139</strong></td>
<td><strong>Common Misconception</strong>, p. 138</td>
</tr>
<tr>
<td><strong>Math Message</strong>, p. 142</td>
<td><strong>Differentiation Options</strong>, p. 141</td>
</tr>
<tr>
<td><strong>Solving Unit Conversion Number Stories</strong>, p. 143</td>
<td><strong>ELL Support</strong>, p. 141</td>
</tr>
<tr>
<td><strong>Home Link 2-6</strong>, p. 145</td>
<td><strong>Online Differentiation Support 2-6 Academic Language Development</strong>, p. 143</td>
</tr>
<tr>
<td><strong>Enrichment</strong>, p. 141</td>
<td><strong>Adjusting the Activity</strong>, p. 144</td>
</tr>
<tr>
<td><strong>Extra Practice</strong>, p. 141</td>
<td><strong>Differentiation Options</strong>, p. 147</td>
</tr>
<tr>
<td><strong>Math Boxes 2-6</strong>, p. 145</td>
<td><strong>ELL Support</strong>, p. 147</td>
</tr>
<tr>
<td><strong>Comparing Multiplication Methods</strong>, p. 151</td>
<td><strong>Adjusting the Activity</strong>, p. 149</td>
</tr>
<tr>
<td><strong>Readiness</strong>, p. 147</td>
<td><strong>ELL Support</strong>, p. 155</td>
</tr>
<tr>
<td>RIGOR</td>
<td>Conceptual Understanding</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Unit 2 Organizer</strong></td>
<td></td>
</tr>
<tr>
<td>2-9</td>
<td>Open Response</td>
</tr>
<tr>
<td>2-10</td>
<td>A Mental Division Strategy</td>
</tr>
<tr>
<td>2-11</td>
<td>Reviewing Partial-Quotients Division</td>
</tr>
<tr>
<td>2-12</td>
<td>Strategies for Choosing Partial Quotients</td>
</tr>
<tr>
<td><strong>Distributed Practice</strong></td>
<td>Mental Math and Fluency, p. 161</td>
</tr>
<tr>
<td><strong>Differentiation Support</strong></td>
<td>ELL Support, p. 162</td>
</tr>
<tr>
<td></td>
<td>Adjusting the Activity, pp. 163, 168</td>
</tr>
</tbody>
</table>

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
Extra Practice, p. 191

Math Message, p. 192
Modeling a Division Problem, pp. 192-194
Interpreting Remainders, pp. 194-196
Home Link 2-13, p. 197
Differentiation Options, p. 191

Interpreting Remainders, pp. 194-196
Enrichment, p. 191

Modeling a Division Problem, pp. 192-194
Interpreting Remainders, pp. 194-196

Mental Math and Fluency, p. 192
Playing High-Number Toss, p. 197
Math Boxes 2-13, p. 197

Differentiation Options, p. 191
ELL Support, p. 191
Online Differentiation Support 2-13
Common Misconception, p. 193
Academic Language Development, p. 193

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

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Math Masters</th>
<th>Activity Cards</th>
<th>Manipulative Kit</th>
<th>Other Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>pp. 43–44; TA5; per partnership: G7–G9</td>
<td>15</td>
<td>base-10 blocks; number cards 1–9 (1 of each); per partnership: number cards 0–9 (4 of each)</td>
<td>calculator</td>
</tr>
<tr>
<td>2-2</td>
<td>pp. per partnership: 45–46, 47; per partnership: G10, G11</td>
<td>16</td>
<td>per partnership: two 6-sided dice</td>
<td>slate; scissors; per group: calculator (optional)</td>
</tr>
<tr>
<td>2-3</td>
<td>pp. 48–49; TA5 (optional); TA6</td>
<td>17</td>
<td>number cards 1–10 (1 of each); per partnership: number cards 0–9 (4 of each)</td>
<td>slate; per partnership: poster paper</td>
</tr>
<tr>
<td>2-4</td>
<td>pp. 50–51; TA7 (optional); per partnership: G7–G9</td>
<td>18</td>
<td>per partnership: number cards 0–9 (4 of each)</td>
<td>slate; calculator</td>
</tr>
<tr>
<td>2-5</td>
<td>pp. 52–54; TA6; per group: G3</td>
<td>19</td>
<td>per partnership: number cards 0–9 (4 of each); per group: number cards 1–10 (4 of each); 4 counters</td>
<td>per group: calculator or multiplication/division facts table</td>
</tr>
<tr>
<td>2-6</td>
<td>pp. 55; TA2 (optional); per partnership: G4–G5 (optional), G6</td>
<td>20–21</td>
<td>number cards 1–20 (1 of each); two 6-sided dice; per group: three 12-inch rulers, 36 square pattern blocks</td>
<td>per partnership: Prism Pile-Up cards, calculator (optional)</td>
</tr>
<tr>
<td>2-7</td>
<td>pp. 56–59; G12</td>
<td>22</td>
<td>per partnership: number cards 0–9 (4 of each), 6-sided die</td>
<td>slate</td>
</tr>
<tr>
<td>2-8</td>
<td>pp. 60; per partnership: G2</td>
<td>23</td>
<td>per partnership: number cards 0–10 (4 of each) and number cards 11–20 (1 of each)</td>
<td>per group: poster paper, crayons or markers</td>
</tr>
<tr>
<td>2-9</td>
<td>pp. 61–64; TA4</td>
<td>24</td>
<td>per partnership: stopwatch (optional)</td>
<td>slate; Guidelines for Discussion Poster; colored pencils (optional); selected samples of students’ work; students’ work from Day 1</td>
</tr>
<tr>
<td>2-10</td>
<td>pp. 65; per partnership: TA8; G13</td>
<td>25</td>
<td>per partnership: number cards 1–9 (4 of each), number cards 10–20 (1 of each), two 6-sided dice, 40 counters</td>
<td>slate</td>
</tr>
<tr>
<td>2-11</td>
<td>pp. 66; TA7 (optional); TA9</td>
<td>26</td>
<td>per partnership: number cards 0–9 (4 of each), tape measure</td>
<td>calculator (optional)</td>
</tr>
<tr>
<td>2-12</td>
<td>pp. 67–69; TA7 (optional); TA9–TA10; per partnership: G11</td>
<td>27</td>
<td>number cards 10–20 (1 of each); per partnership: two 6-sided dice</td>
<td>slate; calculator (optional)</td>
</tr>
<tr>
<td>2-13</td>
<td>pp. 70–72; TA7 (optional); TA10 (optional); TA11; per partnership: G10</td>
<td>28</td>
<td>6-sided die</td>
<td></td>
</tr>
<tr>
<td>2-14</td>
<td>pp. 73–76; Assessment Handbook, pp. 14–22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Literature Link

Optional Books:
- [23 Two of Everything: A Chinese Folktale](#)
- [39 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.

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

Virtual Learning Community
vlc.uchicago.edu

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

- **5.OA.2**

  - **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

- **5.NBT.1**

  - **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.

- **5.NBT.2**

  - **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.

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**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.
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
- $(6 \times 10,000) + (5 \times 1,000) + (6 \times 100) + (8 \times 10) + (2 \times 1)$

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 $(2 \times 1)$, 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 $20 \div 10$, 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 $10 \times 10 \times 10$. **Exponential notation** is a way of representing repeated multiplication by the same factor. For example, $10^3$ is exponential notation for $10 \times 10 \times 10$, 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
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 $65 \times 1,000$, or $65 \times 10^3$. Students connect this idea to expanded form. For example, they note that 3,745 can be expressed as $(3 \times 10^3) + (7 \times 10^2) + (4 \times 10^1) + (5 \times 10^0)$.

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 $50 \times 400$ by thinking: I can rewrite $50 \times 400$ as $5 \times 101 \times 4 \times 102$. $5 \times 4 = 20$. 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

### 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.

![Partial-products multiplication](image)

| $3 \times 700$ | 2 | 1 | 0 | 0 |
| $3 \times 50$ | 1 | 5 | 0 |
| $3 \times 2$ | + | 6 | 2 | 2 | 5 | 6 |

Partial-products multiplication

![U.S. traditional multiplication](image)

| $1 \times 752$ | 2 | 2 | 5 | 6 |

U.S. traditional multiplication
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

<table>
<thead>
<tr>
<th>Area model:</th>
<th>18</th>
<th>42</th>
<th>320</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>40</td>
<td>400</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>320</td>
<td>320</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

### U.S. Traditional Multiplication

<table>
<thead>
<tr>
<th>Area model:</th>
<th>18</th>
<th>42</th>
<th>720</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>40</td>
<td>400</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>320</td>
<td>320</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

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.
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 $492 \times 63 = 480,992$ 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." **GMP1.1**

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**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.
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

Warm Up
5 min

Mental Math and Fluency
Students convert between units of length.

Focus
35–40 min

Math Message
Students solve a number story about converting miles to feet.

Converting Miles to Feet
Students complete a table of conversions for miles to feet.

Solving Unit Conversion Number Stories
Students solve number stories involving conversions of units within the U.S. customary system.

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.

Practice
20–30 min

Playing Prism Pile-Up Game
Students practice finding volumes of rectangular prisms and figures composed of rectangular prisms.

Math Boxes 2–6
Students practice and maintain skills.

Home Link 2–6
Homework Students collect measurements and convert them to different units.

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.

Materials

Mental Math and Fluency
5.MD.1

Converting Miles to Feet
5.NBT.5, 5.MD.1

Solving Unit Conversion Number Stories
5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1

Assessment Check-In
5.OA.2, 5.MD.1, SMP4

Playing Prism Pile-Up Game
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

Math Boxes 2–6
5.NBT.5, 5.MD.1

Home Link 2–6
See page 145.

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

Application: Unit Conversions
Overview: Students use unit conversions within the U.S. customary system to solve multistep problems.

Expect most students to be able to use U.S. customary unit conversions to solve problems like those identified.

To see how mastery develops for all standards within the grade, go online.

Go Online
### Differentiation Options

<table>
<thead>
<tr>
<th>Readiness</th>
<th>Enrichment</th>
<th>Extra Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHOLE CLASS</td>
<td>SMALL GROUP</td>
<td>PARTNER</td>
</tr>
</tbody>
</table>

#### Counting to Convert Inches to Feet

*5.MD.1, SMP7*

<table>
<thead>
<tr>
<th>What You Need</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math Journal 1, page 52; Student Reference Book, page 52</td>
<td>Activity Card 20; Math Journal 1, p. 52; Student Reference Book, p. 328</td>
</tr>
</tbody>
</table>

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.

#### Writing Unit Conversion Number Stories

*5.MD.1*

<table>
<thead>
<tr>
<th>What You Need</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math Journal 1, page 52; Student Reference Book, page 328; number cards 1–20 (1 of each); two 6-sided dice</td>
<td>Activity Card 21; Student Reference Book, p. 328; number cards 1–20</td>
</tr>
</tbody>
</table>

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.

**<br>**

#### Converting Units

*5.OA.2, 5.MD.1*

<table>
<thead>
<tr>
<th>What You Need</th>
<th>What To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Reference Book, page 328</td>
<td>Activity Card 21; Student Reference Book, p. 328; number cards 1–20 (1 of each); two 6-sided dice</td>
</tr>
</tbody>
</table>

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.

Warm Up

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 1/2 feet equals how many inches? 18
- 5 1/2 feet equals how many inches? 66
- 54 inches equals how many feet? 4 1/2

Focus

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

<table>
<thead>
<tr>
<th>Miles</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5,280</td>
</tr>
<tr>
<td>2</td>
<td>10,560</td>
</tr>
<tr>
<td>3</td>
<td>15,840</td>
</tr>
<tr>
<td>4</td>
<td>21,120</td>
</tr>
<tr>
<td>5</td>
<td>26,400</td>
</tr>
</tbody>
</table>

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*

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. 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.

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.

Sample picture:

<table>
<thead>
<tr>
<th>1 pound</th>
<th>1 pound</th>
<th>1 pound</th>
<th>1 pound</th>
<th>1 pound</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 ounces</td>
<td>16 ounces</td>
<td>16 ounces</td>
<td>16 ounces</td>
<td>16 ounces</td>
</tr>
</tbody>
</table>

Ask:

- **What information did you need to solve this problem?**
  1 pound = 16 ounces
- **Where did you find that information?** 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. 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 (=, >, <, ≤, ≥, or ≠) 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

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**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.

**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.
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.  

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:

```
1 yard 1 yard 1 yard
3 feet 3 feet 3 feet 7 feet
```

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? $3 \times 3$ Record the expression $3 \times 3$.
- 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 $3 \times 3 + 7$.
- How could we show that the multiplication happens first? Add parentheses, brackets, or braces around $3 \times 3$ Add grouping symbols to show $(3 \times 3) + 7$.
- 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.

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: $3 \times 3 = 9$
- Add the two lengths: $9 + 7 = 16$

Adjusting the Activity

Differentiate Math Journal 1, p. 52

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

Assessment Check-In 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.

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.
3 Practice  20–30 min

Playing Prism Pile-Up

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

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

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.
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

Warm Up
Mental Math and Fluency
Students write numbers in exponential notation.

Focus
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.

Discussing Efficient Strategies
Students discuss strategies for solving the Math Message and consider which ones are more efficient.

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.

Getting Ready for Day 2
Review students’ work and plan discussion for reengagement.

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

Mental Math and Fluency
Students write numbers in exponential notation.

Materials
slate

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.

Getting Ready for Day 2
Review students’ work and plan discussion for reengagement.

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

- ○ ○  $10 \times 1 = 10^1$
  $10 \times 10 = 10^2$
  $10 \times 10 \times 10 = 10^3$
- ● ○ ○  $1,000 = 10^3$
  $10,000 = 10^4$
  $1,000,000 = 10^6$
- ● ● ○  $10 \times 100 = 10^3$
  $100 \times 100 = 10^4$
  $1,000 \times 100 = 10^5$

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?* 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*

**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*
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. \(1 \times 10 = 10\) and \(10 \times 10 = 100\)

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 \(\times 10\) to find the number of seconds it takes to address 10 envelopes. You can multiply 30 \(\times 100\) 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

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.

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. 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? 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? Answers vary.

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? 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? 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.
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? 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 \(100 \times 10,000 = 1,000,000\) 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. 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.
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.

Focus 50–55 min

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.

Reengaging in the Problem
Students examine other students’ work using a rubric as a guide or in a class discussion.

Revising Work
Students revise their work from Day 1.

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.

Materials

Guidelines for Discussions Poster, Standards for Mathematical Process and Practice Poster

Math Masters, p. 63 (optional); selected samples of students’ work

Math Masters, pp. 61–62 (optional), p. 63; students’ work from Day 1; colored pencils (optional)

Goal for Mathematical Process and Practice

CMP6.4
Think about accuracy and efficiency when you count, measure, and calculate.

Not Meeting Expectations
For Problem 4, does not address the efficiency of Maya’s strategy, and for Problem 5, does not use a more efficient strategy.

Partially Meeting Expectations
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).

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).

Exceeding Expectations
Meets expectations and correctly explains how the strategy used for Problem 5 is more efficient than Maya’s.

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
See how mastery develops for all standards within the grade.

my.mheducation.com
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? 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 M6.4 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.

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.
Reengaging in the Problem

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.

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.

Revising Work

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.

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.
**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.

**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.
Day 1: Unit Assessment

1 Warm Up 5–10 min

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.

Unit 2 Challenge (Optional)
Students may demonstrate progress beyond expectations.

Assessment Handbook, pp. 15–18

Assessment Handbook, pp. 19–20

<table>
<thead>
<tr>
<th>Standards</th>
<th>Goals for Mathematical Content (GMC)</th>
<th>Lessons</th>
<th>Self Assessment</th>
<th>Unit 2 Assessment</th>
<th>Unit 2 Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.OA.1</td>
<td>Write numerical expressions that contain grouping symbols.</td>
<td>2-6</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.OA.2</td>
<td>Model real-world and mathematical situations using simple expressions.</td>
<td>2-6</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interpret numerical expressions without evaluating them.</td>
<td>2-7</td>
<td></td>
<td>1a</td>
<td></td>
</tr>
<tr>
<td>5.NBT.1</td>
<td>Understand the relationship between the places in multidigit numbers.</td>
<td>2-1, 2-2</td>
<td>1, 2</td>
<td>1, 2, 6</td>
<td></td>
</tr>
<tr>
<td>5.NBT.2</td>
<td>Use whole-number exponents to denote powers of 10.</td>
<td>2-2, 2-3</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiply whole numbers by powers of 10; explain the number of zeros in the product.</td>
<td>2-2, 2-3, 2-9, 2-10</td>
<td>4</td>
<td>3a, 5a, 5b</td>
<td>1b</td>
</tr>
<tr>
<td>5.NBT.5</td>
<td>Fluently multiply multidigit whole numbers using the standard algorithm.</td>
<td>2-4 to 2-9</td>
<td>5</td>
<td>10, 11</td>
<td>2</td>
</tr>
<tr>
<td>5.NBT.6</td>
<td>Divide multidigit whole numbers.</td>
<td>2-10 to 2-13</td>
<td>6</td>
<td>9, 12, 13</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Illustrate and explain solutions to division problems.</td>
<td>2-11 to 2-13</td>
<td>7</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>5.MD.1</td>
<td>Convert among measurement units within the same system.</td>
<td>2-6</td>
<td>7, 8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use measurement conversions to solve multi-step, real-world problems.</td>
<td>2-6</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
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
SMP6 | Explain your mathematical thinking clearly and precisely.  **GMP6.1** | 2-2-3 | 3b, 5b | 1c
SMP7 | Use structures to solve problems and answer questions.  **GMP7.2** | 2-1, 2-2, 2-10 | 5b

**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.

**Unit 2 Self Assessment**

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

<table>
<thead>
<tr>
<th>Task</th>
<th>Can do this on my own and explain how to do it.</th>
<th>Can do this if I get help or look at an example.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify ones of number in a multidigit number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write numbers in expanded form.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Represent powers of 10 in exponential notation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain patterns when multiplying by a power of 10.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiply with U.S. traditional multiplication.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divide multidigit numbers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpret a remainder in a division problem.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Assessment Handbook, p. 14*
<p>Unit 2 Assessment</p>

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.

2a Assess 35–50 min

### Unit 2 Assessment

Assessment Handbook, pp. 15–18

<table>
<thead>
<tr>
<th>WHOLE CLASS</th>
<th>SMALL GROUP</th>
<th>PARTNER</th>
<th>INDEPENDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

### Unit 2 Assessment (continued)

Complete the table.

<table>
<thead>
<tr>
<th>Standard Notation</th>
<th>Products of 10s</th>
<th>Exponential Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>10 × 10 × 10</td>
<td>10^3</td>
</tr>
<tr>
<td>100,000</td>
<td>10 × 10 × 10 × 10</td>
<td>10^5</td>
</tr>
<tr>
<td>1,000,000</td>
<td>10 × 10 × 10 × 10 × 10</td>
<td>10^7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Jerrell and Tylor won playing high number toss. They created the numbers shown below. Write each number in standard notation. Circle the player who won the toss. Jerrell: 624,000 Tylor: 15,900,000 Sample answer: I just needed to attach zeros to the end of each number. The exponent tells me the number of zeros to attach.

Assessment Handbook, p. 16
### 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.

### Differentiate Adjusting the Assessment

<table>
<thead>
<tr>
<th>Item(s)</th>
<th>Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>To scaffold Items 1 and 2, have students use a place-value chart.</td>
</tr>
<tr>
<td>3</td>
<td>To extend Item 3, have students explain whether they overestimated or underestimated the actual number of cans Jesse has.</td>
</tr>
<tr>
<td>4</td>
<td>To scaffold Item 4, have students use calculators to check that the product of 10s is correct.</td>
</tr>
<tr>
<td>5</td>
<td>To extend Item 5, have students write numbers that would beat both Jamella and Ilyssa in High-Number Toss.</td>
</tr>
<tr>
<td>6</td>
<td>To extend Item 6, have students write the number in expanded form in a different way.</td>
</tr>
<tr>
<td>7</td>
<td>To scaffold Item 7, have students use words to describe the relationship between pounds and ounces. Record the relationship with an expression to fill in the remaining rows.</td>
</tr>
<tr>
<td>8</td>
<td>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.</td>
</tr>
<tr>
<td>9</td>
<td>To extend Item 9, have students write and solve another number story in which they have to interpret the remainder.</td>
</tr>
<tr>
<td>10, 11</td>
<td>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.</td>
</tr>
<tr>
<td>12, 13</td>
<td>To scaffold Items 12 and 13, provide copies of Math Masters, page TA10, and have students write lists of multiples for the divisors.</td>
</tr>
</tbody>
</table>
Students can complete the Unit 2 Challenge after they complete the Unit 2 Assessment.

### Unit 2 Challenge

**Task 1:**
- Divide 1,440 by 60 using partial-quotients division.
- Complete an area model to show each solution.

**Problem:**

\[
\begin{align*}
1,440 & \div 60 = \underline{?} \\
\end{align*}
\]

**Area Model:**
- Area (Dividend): 1,440
- Width (Quotient): 24
- Length (Divisor): 60

**Task 2:**
- Solve the following problem in two different ways using partial-quotients division.
- Complete an area model to show each solution.

**Problem:**

\[
\begin{align*}
1,200 & \div 24 = \underline{?} \\
\end{align*}
\]

**Area Model:**
- Area (Dividend): 1,200
- Width (Quotient): 20
- Length (Divisor): 24

**Task 3:**
- Write an expression with grouping symbols to model the problem. Then solve.

**Problem:** 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?

**Expression:** \([(8 \times 9) \times 6] \times 20\)

**Answer:** $3,888

**Task 4:**
- Sally and Paul solved the same multiplication problem. Sally used U.S. traditional multiplication. Paul used a different strategy.

**Paul’s Strategy:**
- 101 \times 26 = ?
- 100 \times 26 = 2,600
- 1 \times 26 = 26
- 2,600 + 26 = 2,626

**Sample Answer:** Paul’s strategy seems more efficient because I can do all his steps in my head.

**Task 5:**
- Evaluate each of the expressions.

\[
\begin{align*}
6 \times 10^8 & = 600,000,000 \\
68 \times 10^3 & = 68,000 \\
5 \times 10^5 & = 50,000,000 \\
5 \times 10^7 & = 500,000,000 \\
\end{align*}
\]
Unit 2 Progress Check

Overview

Day 2: Administer the Cumulative Assessment.

Day 2: Cumulative Assessment

Assess 35–45 min

Cumulative Assessment
These items reflect mastery expectations to this point.

Materials
Assessment Handbook pp. 21–22

<table>
<thead>
<tr>
<th>Standards</th>
<th>Goals for Mathematical Content (GMC)</th>
<th>Cumulative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.OA.1</td>
<td>Write numerical expressions that contain grouping symbols.</td>
<td>1–4</td>
</tr>
<tr>
<td>5.OA.2</td>
<td>Interpret numerical expressions without evaluating them.</td>
<td>5a, 5b</td>
</tr>
<tr>
<td>5.MD.1</td>
<td>Convert among measurement units within the same system.</td>
<td>9b</td>
</tr>
<tr>
<td></td>
<td>Use measurement conversions to solve multi-step, real-world problems.</td>
<td>9b</td>
</tr>
<tr>
<td>5.MD.3, 5.MD.3a</td>
<td>Understand that a unit cube has 1 cubic unit of volume and can measure volume.</td>
<td>7</td>
</tr>
<tr>
<td>5.MD.3, 5.MD.3b</td>
<td>Understand that a solid figure completely filled by (n) unit cubes has volume (n) cubic units.</td>
<td>6a, 6b, 7</td>
</tr>
<tr>
<td>5.MD.4</td>
<td>Measure volumes by counting unit cubes and improvised units.</td>
<td>6a, 6b</td>
</tr>
<tr>
<td>5.MD.5, 5.MD.5a</td>
<td>Represent products of three whole numbers as volumes.</td>
<td>8</td>
</tr>
<tr>
<td>5.MD.5, 5.MD.5b</td>
<td>Apply formulas to find volumes of rectangular prisms.</td>
<td>8, 9a</td>
</tr>
<tr>
<td>5.MD.5, 5.MD.5c</td>
<td>Find volumes of figures composed of right rectangular prisms.</td>
<td>9a</td>
</tr>
<tr>
<td></td>
<td>Solve real-world problems involving volumes of figures composed of prisms.</td>
<td>9a</td>
</tr>
</tbody>
</table>

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        |

Look Ahead 10–15 min

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

Materials
Math Journal 1 p. 70

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

Materials
Math Masters pp. 73–76

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

my.mheducation.com
**Assessment Handbook, p. 21**

**Unit 2 Cumulative Assessment (continued)**

- **Item 5:** Why is a unit cube a good unit for measuring volume?
  - Sample answer: Cubes fit into corners and pack neatly.
  - Sample answer: He filled in the rest of the base with cubes and saw that it would be 12. The height is 6. 12 * 6 = 72 cubes.

- **Item 6:** To scaffold Item 6, provide students with unit cubes and allow them to build the rectangular prism shown.
  - volumes of the boxes are as follows:
    - Volume of Box 1: 72 cubes
    - Volume of Box 2: 120 cubes
    - Volume of Box 3: 160 cubes

- **Item 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.
  - hint: V = l * w * h and V = B * h.

- **Item 8:** To scaffold Item 8, remind students what each of the variables represents in the formulas.
  - $V = l \times w \times h$ and $V = B \times h$.

- **Item 9:** To extend Item 9, ask students to sketch a storage unit that would be large enough to fit the family’s belongings.

**Assessment Handbook, p. 22**

**Unit 2 Cumulative Assessment**

**Assess 35–45 min**

**Cumulative Assessment**

**Assessment Handbook, pp. 21–22**

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.

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**Differentiate Adjusting the Assessment**

- **Item 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.
- **Item 5:** To extend Item 5, have students write additional expressions that could be placed in each column of the table.
- **Item 6:** To scaffold Item 6, provide students with unit cubes and allow them to build the rectangular prism shown.
- **Item 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.
- **Item 8:** To scaffold Item 8, remind students what each of the variables represents in the formulas $V = l \times w \times h$ and $V = B \times h$.
- **Item 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.

Look Ahead 10–15 min

Math Boxes 2-14: Preview for Unit 3
Math Journal 1, p. 70

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.
GRADE 5


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