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

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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.

About *Everyday Mathematics*........................... iv

*Everyday Mathematics* in Your Classroom ............. x
- Lesson Overview and Components
- Digital Resources and Instructional Support
- Assessment and Differentiation
- Your Classroom Resource Package

Pathway to Mastery ....... xxx
- Correlations and Mastery Expectations
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.

**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.*

**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.

**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.

**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.


About _Everyday Mathematics_
ABOUT EVERYDAY MATHEMATICS

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.

Major Clusters

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

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.
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>Links to the Past</th>
<th>Links to the Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.OA.1 In Unit 1, students reviewed how to use grouping symbols in expressions and how to evaluate expressions with grouping symbols.</td>
<td>5.OA.2 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 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>

Linking Prior and Future Knowledge

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

Rigorous Content

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

Planning for Rich Math Instruction

<table>
<thead>
<tr>
<th>RIGOR</th>
<th>Conceptual Understanding</th>
<th>Procedural Skill and Fluency</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Understanding Place Value</strong></td>
<td>The relationship between places in multi-digit numbers</td>
<td>Home Link 2-1, p. 115</td>
<td>Introducing Powers of 10, p. 118</td>
</tr>
<tr>
<td><strong>Exponents and Powers of 10</strong></td>
<td>Exponential notation</td>
<td>Journal, p. 44-47</td>
<td>Solving a Real World Volume Problem, p. 121</td>
</tr>
<tr>
<td><strong>U.S. Traditional Multiplication, Part 1</strong></td>
<td>Multiplying 1-Digit Numbers by 1-Digit Numbers, p. 132</td>
<td>Mental Math and Fluency, p. 130</td>
<td>Multiplying 2-Digit Numbers by 1-Digit Numbers, p. 132</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
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.

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.

“I can do this!”
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.
Key Components

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

Open Response and Reengagement Lessons

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

Games

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

Activity Cards

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

Quick Looks

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

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

The Teacher Center

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

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.

Geometer’s Sketchpad Activities and EM Games Online
Easy to access Fact Practice games and full integration of The Geometer’s Sketchpad® activities.

Tutorial Videos
Demonstrations of concepts and skills.

EM at Home
Parents have easy access to resources to help them support their child’s learning.

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.

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

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

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

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

Quick Entry Evaluation Tool

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

Report

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

---

**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>
<tr>
<td><strong>Counting to Convert Inches to Feet</strong></td>
<td><strong>Writing Unit Conversion Number Stories</strong></td>
<td><strong>Converting Units</strong></td>
</tr>
<tr>
<td>5 and 1 Daily</td>
<td>Activity Card 20: Math Journal 1, p. 52: Student Reference Block p. 328</td>
<td>Activity Card 21: Student Reference Book, p. 328: number card block (1 of each); two 6-10</td>
</tr>
<tr>
<td>per group: three 12-inch rulers. 36 square pattern blocks</td>
<td>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.</td>
<td>For more practice, students roll dice to generate unit conversion calculations and record their work.</td>
</tr>
</tbody>
</table>

**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 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.

**Common Misconceptions**

**Point-of-Use Differentiation**

**Assessment Adjustments** Suggestions for scaffolding and extending Progress Check assessments.

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

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

**Common Misconceptions** Notes that suggest how to use observations of students’ work to adapt instruction.
Supporting Rich Mathematical Instruction

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

Planning

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

Preparing

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

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

Resources

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

Fourth Grade Everyday Mathematics

Welcome to Fourth 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 4 has 112 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 the pacing of Everyday Mathematics 4 is designed to give you the time you’ll need.

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

Preparing for the Beginning of School

- Use the list on pages xxvi-xxvii to check that your Classroom Resource Package is complete.
- See page xxx 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 4–9 to distribute early in the school year.
- Review the Beginning-of-Year Assessment on pages 76–79 in the Assessment Handbook and consider when you will administer it.

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

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

Part 1: Warm Up

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Description</th>
<th>Tips</th>
</tr>
</thead>
</table>
| Mental Math and Fluency | Quick, leveled warm-up exercises students answer orally, with gestures, or on slates or tablets that provide practice towards fluency. | • Select the levels that make sense for your students and customize for your class.  
• Spend 5 or fewer minutes on this feature. |

Part 2: Focus

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

**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.
- Look for Goals for Mathematical Process and Practice icons.
- Use these to facilitate discussions about the Process and Practice Standards.
- Go Online to the Spiral Tracker to see the complete spiral.
- 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 Description Tips

**Practice Activity**

An opportunity to practice previously taught skills and content through a practice page or a game in many lessons.

- Allow time for practice pages and games because they are critical for students to meet expectations for standards. This is an essential part of the distributed practice in *Everyday Mathematics*.
- Plan for all students to play *Everyday Mathematics* games at least 60 minutes per week.
- Go Online to the Implementation Guide for tips to ensure that all students have ample game time.
- See also the Virtual Learning Community (VLC) to observe many *Everyday Mathematics* games in action.

**Math Boxes**

A daily *Math Journal* page that reviews skills and concepts which students have seen prior to that point in the program. Preview Math Boxes anticipate content in the upcoming unit.

- Aim to have students complete Math Boxes with as little teacher support as possible.
- Complete Math Boxes at any point during the day.

**Home Link**

A daily homework page that provides practice and informs families about the math from that day’s lesson.

- Encourage students to do these activities with someone at home, such as a parent, caregiver, or sibling.

Differentiation and Language Features Description and Purpose

<table>
<thead>
<tr>
<th>Differentiation and Language Features</th>
<th>Description and Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjusting the Activity</strong></td>
<td>Allows for differentiated instruction by offering modifications to lesson activities.</td>
</tr>
<tr>
<td><strong>Common Misconception</strong></td>
<td>Offers point-of-use intervention tips that address common misconceptions.</td>
</tr>
<tr>
<td><strong>Game Modifications</strong></td>
<td>Provides suggestions online for modifying games to support students who struggle and challenge students who are ready.</td>
</tr>
<tr>
<td><strong>Differentiation Support</strong></td>
<td>Offers two online pages of specific differentiation ideas for each lesson, as well as ELL suggestions and scaffolding for students who need it.</td>
</tr>
<tr>
<td><strong>Academic Language Development</strong></td>
<td>Suggests how to introduce new academic vocabulary that is relevant to the lesson. These notes benefit all students, not solely English language learners</td>
</tr>
<tr>
<td><strong>English Language Learners (ELL)</strong></td>
<td>Provides activities and point-of-use ideas for supporting students at different levels of English language proficiency.</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>
</table>
| Teacher’s Lesson Guide (Volumes 1 and 2) | • Comprehensive guide to the *Everyday Mathematics* lessons and assessments  
• Standards alignment information: digital version includes online tracking of each content standard  
• Point-of-use differentiation strategies: Readiness, Enrichment, Extra Practice, English Language Learners Support, Academic Language Development, Adjusting the Activity, Game Modifications, Common Misconception  
• Additional Differentiation Support pages available digitally for virtually every lesson  
• Unit overviews  
• Planning and calendar tools |
| eToolkit | • Online tools and virtual manipulatives for dynamic instruction  
• A complete list of Grade 4 eTools on page xxix |
| ePresentations | • Ready-made interactive white board lesson content to support daily instruction |
| Math Masters | • Reproducible masters for lessons, Home Links, Family Letters, and games |
| Classroom Posters | • Posters that display grade-specific mathematical content |
### 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>
</table>
| **Student Math Journal, (Volumes 1 and 2)** | - Student work pages that provide daily support for classroom instruction  
- Provide a long-term record of each student's mathematical development |
| ✔️ digital  
✔️ print | |
| **Geometry Template** | - eTools to support mathematical concepts, including geometry and measurement  
- Also available as plastic templates |
| ✔️ digital  
✔️ print | |
| **Student Reference Book** | - Resource to support student learning in the classroom and at home  
- Includes explanations of mathematical content and directions for many *Everyday Mathematics* games |
| ✔️ digital  
✔️ print | |
| **Activity Cards** | - Directions for students for Differentiation Options and other small-group activities |
| ✔️ digital  
✔️ print | |
| **Student Learning Center** | - Combines *Student Math Journal*, *Student Reference Book*, eToolkit, and Activity Cards, and other resources for students in one location  
- Interactive functionality provides access in English and Spanish  
- Interactive functionality provides immediate feedback on select problems  
- Animations that can help with skills and concepts and reinforce classroom teaching  
- Provides access to EM Games Online and Facts Workshop Game |
| ✔️ digital  
☐ print | |
| **EM Games Online** | - Digital versions of many of the *Everyday Mathematics* games that provide important practice in a fun and engaging setting |
| ✔️ digital  
☐ print | |
Manipulative Kits and eToolkit

The table below lists the materials that are used on a regular basis throughout *Fourth 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>Quantity</th>
<th>eTools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base-10 Big Cube</td>
<td>Not in kit</td>
<td></td>
</tr>
<tr>
<td>Base-10 Flats</td>
<td>6 packs of 10 flats</td>
<td>✔</td>
</tr>
<tr>
<td>Base-10 Longs</td>
<td>5 packs of 50 longs</td>
<td>✔</td>
</tr>
<tr>
<td>Base-10 Cubes</td>
<td>10 packs of 100 cubes</td>
<td>✔</td>
</tr>
<tr>
<td>Beakers, Nested Graduated Set</td>
<td>1 set; 5 beakers in each set</td>
<td>✔</td>
</tr>
<tr>
<td>Clock Faces</td>
<td>Not in kit</td>
<td>✔</td>
</tr>
<tr>
<td>Connectors</td>
<td>1 pack of 2,000</td>
<td>✔</td>
</tr>
<tr>
<td>Counters, Double-Sided</td>
<td>Not in kit</td>
<td>✔</td>
</tr>
<tr>
<td>Counters; Translucent (red, yellow, blue, green)</td>
<td>5 packs of 200</td>
<td>✔</td>
</tr>
<tr>
<td>Dice, Dot</td>
<td>2 packs of 12</td>
<td>✔</td>
</tr>
<tr>
<td>Dice, Polyhedral</td>
<td>Not in kit</td>
<td>✔</td>
</tr>
<tr>
<td>Dice, 10-Sided, numbered 0–9</td>
<td>25 dice</td>
<td>✔</td>
</tr>
<tr>
<td>Everything Math Deck</td>
<td>15 decks</td>
<td>✔</td>
</tr>
<tr>
<td>Fraction Circle Pieces</td>
<td>25 sets</td>
<td>✔</td>
</tr>
<tr>
<td>Geoboards, Two-Sided, 7” by 7”</td>
<td>8 geoboards</td>
<td>✔</td>
</tr>
<tr>
<td>Marker Boards</td>
<td>25 boards</td>
<td>✔</td>
</tr>
<tr>
<td>Measuring Cups: Cup, Pint, Quart, Gallon</td>
<td>1 set</td>
<td>✔</td>
</tr>
<tr>
<td>Medicine Dropper, 1 mL</td>
<td>12 droppers</td>
<td>✔</td>
</tr>
<tr>
<td>Metersticks, Dual Scale</td>
<td>2 packs of 10</td>
<td>✔</td>
</tr>
<tr>
<td>Number Line, –35 to 180</td>
<td>1 number line (in 3 parts)</td>
<td>✔</td>
</tr>
<tr>
<td>Pattern Blocks</td>
<td>2 sets of 250</td>
<td>✔</td>
</tr>
<tr>
<td>Play Money Bill Sets</td>
<td>Not in kit</td>
<td>✔</td>
</tr>
<tr>
<td>Play Money Coin Set</td>
<td>1 set</td>
<td>✔</td>
</tr>
<tr>
<td>Protractor, Half-Circle</td>
<td>25 protractors</td>
<td>✔</td>
</tr>
<tr>
<td>Rocker (Pan) Balance</td>
<td>Not in kit</td>
<td>✔</td>
</tr>
<tr>
<td>Rubber Bands</td>
<td>1 pack of 400</td>
<td>✔</td>
</tr>
<tr>
<td>Ruler, 12 in.</td>
<td>1 set of 25 rulers</td>
<td>✔</td>
</tr>
<tr>
<td>Tape Measure, Retractable</td>
<td>15 tape measures</td>
<td>✔</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 Operations and Algebraic Thinking</th>
<th>Everyday Mathematics Goals for Mathematical Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster</strong> Write and interpret numerical expressions. <strong>5.OA.1</strong> Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</td>
<td><strong>EMC</strong> Write numerical expressions that contain grouping symbols. <strong>EMC</strong> Evaluate expressions that contain grouping symbols.</td>
</tr>
<tr>
<td><strong>Cluster</strong> 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 (1892 \times 921)) is three times as large as (1892 \times 921), without having to calculate the indicated sum or product.</td>
<td><strong>EMC</strong> Model real-world and mathematical situations using simple expressions. <strong>EMC</strong> Interpret numerical expressions without evaluating them.</td>
</tr>
<tr>
<td><strong>Cluster</strong> Analyze patterns and relationships. <strong>5.OA.2</strong> 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.</td>
<td><strong>EMC</strong> Generate numerical patterns using given rules. <strong>EMC</strong> Identify relationships between corresponding terms of two patterns. <strong>EMC</strong> Form ordered pairs from corresponding terms of patterns and graph them.</td>
</tr>
</tbody>
</table>

**Goals for Mathematical Content**

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

**Goals for Mathematical Practice**

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

---

### 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 mymheducation.com to use the Spiral Tracker.

**Spiral Towards Mastery Progress** The Spiral Trace outlines instructional trajectories for key standards in Unit 2. For each standard it highlights opportunities for Focus instruction, Warm Up and Practice activties, as well as formatice 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

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.

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The Mastery Expectations charts starting on page xi provide a full picture of how every standard develops across the entire grade.
Correlation to the Standards for Mathematics

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

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

<table>
<thead>
<tr>
<th>Content Standards for Mathematics for Grade 4</th>
<th>Everyday Mathematics Grade 4 Lessons*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operations and Algebraic Thinking</strong> 4.OA</td>
<td></td>
</tr>
<tr>
<td><strong>Use the four operations with whole numbers to solve problems.</strong></td>
<td></td>
</tr>
<tr>
<td>4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 \times 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</td>
<td>2-6, 2-8, 2-9, 2-12, 4-8, 4-10, 5-6, 5-9, 6-11 (3-1, 3-3, 3-13, 4-6, 4-9, 4-12, 6-2, 6-4)</td>
</tr>
<tr>
<td>4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</td>
<td>2-6, 2-8, 2-9, 2-12, 3-12, 4-1, 4-8, 5-3, 5-9, 6-3, 6-6, 6-11, 7-2 (3-2, 3-4, 3-11, 3-13, 4-6, 4-12, 6-8)</td>
</tr>
<tr>
<td>4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</td>
<td>1-5, 1-6, 1-7, 1-9, 1-10, 2-6, 3-3, 3-4, 4-2, 4-9, 4-12, 5-5, 5-13, 6-5, 6-8, 7-7, 7-12, 8-1, 8-4, 8-9, 8-10 (1-11, 1-12, 2-8, 2-9, 2-11, 2-12, 2-13, 3-5, 3-6, 3-7, 3-8, 3-10, 4-9, 4-11, 4-13, 5-1, 5-3, 5-10, 6-1, 6-2, 6-3, 6-4, 6-10, 6-11, 6-13, 7-9, 7-13, 8-6, 8-7, 8-8)</td>
</tr>
<tr>
<td><strong>Gain familiarity with factors and multiples.</strong></td>
<td></td>
</tr>
<tr>
<td>4.OA.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.</td>
<td>2-3, 2-4, 2-5, 2-8, 2-9, 2-10, 2-13, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-8, 3-9, 3-11, 3-12, 4-1, 4-2, 4-3, 4-11, 4-12, 6-1, 6-3, 6-7, 7-5 (2-6, 2-7, 2-12, 4-6, 4-8, 4-13, 6-10)</td>
</tr>
<tr>
<td><strong>Generate and analyze patterns.</strong></td>
<td></td>
</tr>
<tr>
<td>4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</td>
<td>1-8, 2-1, 2-4, 2-6, 2-13, 3-2, 3-4, 3-10, 4-2, 6-8, 7-9 (1-1, 1-3, 1-10, 2-11, 6-1, 6-3, 7-5, 7-7, 7-11, 7-13)</td>
</tr>
<tr>
<td><strong>Number and Operations in Base Ten</strong> 4.NBT</td>
<td></td>
</tr>
<tr>
<td><strong>Generalize place value understanding for multi-digit whole numbers.</strong></td>
<td></td>
</tr>
<tr>
<td>4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.</td>
<td>1-1, 1-2, 1-4, 1-8, 1-13, 2-3, 2-7, 3-6, 4-1, 4-5, 6-1 (1-3, 2-11, 2-13, 3-8, 3-11, 3-13, 4-3)</td>
</tr>
</tbody>
</table>
Content Standards for Mathematics for Grade 4

4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Everyday Mathematics Grade 4 Lessons*

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

Use place value understanding and properties of operations to perform multi-digit arithmetic.

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

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

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

Number and Operations—Fractions3 4.NF

Extend understanding of fraction equivalence and ordering.

4.NF.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
### Content Standards for Mathematics for Grade 4

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

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

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

**4.NF.3a** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

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

**4.NF.3c** Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

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

**4.NF.4b** Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)

**4.NF.4c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

### Everyday Mathematics Grade 4 Lessons*

<table>
<thead>
<tr>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1, 3-3, 3-5, 3-6, 3-7, 3-11, 4-9, 5-11, 6-6, 6-7, 6-8, 6-11, 6-12, 7-2, 7-3, 7-7, 7-10, 7-13, 8-5, 8-9, 8-10, 8-11</td>
</tr>
<tr>
<td>2-10, 4-2, 4-4, 4-7, 5-1, 5-2, 5-3, 5-4, 6-10, 8-6, 8-8</td>
</tr>
<tr>
<td>3-8, 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-13, 6-1, 6-3, 6-5, 6-6, 6-9, 6-12, 6-13, 7-1, 7-2, 7-3, 7-5, 7-6, 7-8, 7-9, 7-10, 7-11, 7-12, 7-13, 8-1, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10, 8-11, 8-12, 8-13</td>
</tr>
<tr>
<td>2-10, 4-10, 5-11, 5-12, 6-2, 6-4, 6-5, 6-6, 6-7, 6-8, 6-10, 7-3, 7-4, 7-5, 7-7, 7-9, 7-11, 8-2, 8-3, 8-4, 8-8, 8-10, 8-12</td>
</tr>
<tr>
<td>5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-13, 6-1, 6-3, 6-9, 6-12, 6-13, 7-1, 7-2, 7-6, 7-8, 7-9, 7-10, 7-12, 7-13, 8-1, 8-5, 8-6, 8-7, 8-9</td>
</tr>
<tr>
<td>4-10, 5-11, 5-12, 6-2, 6-4, 6-5, 6-6, 6-8, 6-10, 7-3, 7-4, 7-5, 7-7, 7-9, 7-11, 8-2, 8-3, 8-4, 8-8, 8-10, 8-12</td>
</tr>
<tr>
<td>3-8, 5-1, 5-2, 5-3, 5-4, 5-6, 5-7, 5-8, 6-12, 8-13</td>
</tr>
<tr>
<td>4-10, 5-5</td>
</tr>
<tr>
<td>5-4, 5-8, 5-9, 6-1, 6-3, 6-12, 6-13, 7-1, 7-6, 7-8, 7-9, 7-10, 7-11, 7-12, 7-13, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10, 8-12, 8-13</td>
</tr>
<tr>
<td>5-6, 5-11, 5-13, 6-5, 6-6, 6-7, 6-9, 6-10, 7-5, 7-6, 7-7, 7-8, 8-2, 8-4, 8-12</td>
</tr>
<tr>
<td>5-3, 5-4, 5-7, 5-8, 6-12, 7-1, 7-6, 7-9, 7-10, 7-11, 7-12, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10, 8-11</td>
</tr>
<tr>
<td>5-5, 5-6, 5-9, 5-11, 5-12, 5-13, 6-9, 6-10, 7-2, 7-3, 7-4, 7-5, 7-7, 7-13, 8-12, 8-13</td>
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<td>6-13, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-9, 7-10, 7-11, 7-12, 7-13, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10, 8-11, 8-12, 8-13</td>
</tr>
<tr>
<td>7-8, 8-4</td>
</tr>
<tr>
<td>7-3, 7-4, 8-13</td>
</tr>
<tr>
<td>7-5, 7-6, 7-8, 8-1, 8-3</td>
</tr>
<tr>
<td>6-13, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-9, 7-10, 7-11, 7-12, 7-13, 8-1, 8-2, 8-7, 8-8, 8-9, 8-10, 8-11</td>
</tr>
<tr>
<td>7-1, 7-8, 8-2, 8-4</td>
</tr>
<tr>
<td>6-13, 7-2, 7-3, 7-4, 7-5, 7-6, 7-9, 7-10, 7-11, 7-12, 8-2, 8-7, 8-8, 8-9, 8-10, 8-11</td>
</tr>
<tr>
<td>6-8, 7-1, 8-6, 8-12, 8-13</td>
</tr>
</tbody>
</table>
# Content Standards for Mathematics for Grade 4

<table>
<thead>
<tr>
<th>Understand decimal notation for fractions, and compare decimal fractions.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.NF.5</strong> Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 3/4/100$.</td>
</tr>
<tr>
<td><strong>4.NF.6</strong> Use decimal notation for fractions with denominators 10 or 100. For example, rewrite $0.62$ as $62/100$; describe a length as $0.62$ meters; locate $0.62$ on a number line diagram.</td>
</tr>
<tr>
<td><strong>4.NF.7</strong> Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $&gt;$, $=$, or $&lt;$, and justify the conclusions, e.g., by using a visual model.</td>
</tr>
</tbody>
</table>

# Measurement and Data 4.MD

<table>
<thead>
<tr>
<th>Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.MD.1</strong> Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that $1$ ft is $12$ times as long as $1$ in. Express the length of a $4$ ft snake as $48$ in. Generate a conversion table for feet and inches listing the number pairs $(1, 12), (2, 24), (3, 36), ...$</td>
</tr>
<tr>
<td><strong>4.MD.2</strong> Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</td>
</tr>
<tr>
<td><strong>4.MD.3</strong> Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</td>
</tr>
</tbody>
</table>

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*Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.
### Content Standards for Mathematics for Grade 4

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Represent and interpret data.</strong></td>
<td></td>
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<tr>
<td>4.MD.4</td>
<td>Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</td>
<td>5-9, 7-9, 7-13, 8-5 (4-10, 6-6, 6-8, 6-10, 7-5, 7-7, 8-6, 8-8)</td>
</tr>
<tr>
<td><strong>Geometric measurement: Understand concepts of angle and measure angles.</strong></td>
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</tr>
<tr>
<td>4.MD.5</td>
<td>Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</td>
<td>5-10, 5-11, 6-9, 6-10, 6-11, 7-4, 7-12, 8-11 (6-1, 6-3, 7-1, 7-2, 7-3, 7-10)</td>
</tr>
<tr>
<td>4.MD.5a</td>
<td>An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a &quot;one-degree angle,&quot; and can be used to measure angles.</td>
<td>5-10, 5-11, 6-9, 6-10, 6-11, 7-4, 7-12, 8-11 (6-1, 6-3, 7-1, 7-3, 7-10)</td>
</tr>
<tr>
<td>4.MD.5b</td>
<td>An angle that turns through ( n ) one-degree angles is said to have an angle measure of ( n ) degrees.</td>
<td>5-10, 5-11, 6-9, 6-10, 6-11, 7-4, 7-12, 8-11 (7-1, 7-3)</td>
</tr>
<tr>
<td>4.MD.6</td>
<td>Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</td>
<td>6-9, 6-10, 6-11, 7-4, 7-12, 8-2, 8-11 (6-13, 7-1, 7-2, 7-3, 7-10, 8-1, 8-3, 8-10)</td>
</tr>
<tr>
<td>4.MD.7</td>
<td>Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</td>
<td>6-11, 7-12, 8-2, 8-3, 8-11 (7-2, 7-4, 7-6, 7-8, 8-1, 8-5, 8-7, 8-9, 8-12)</td>
</tr>
</tbody>
</table>
### Content Standards for Mathematics for Grade 4

#### Geometry 4.G

<table>
<thead>
<tr>
<th>Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.G.1</strong> Draw points, lines, line segments, rays (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</td>
</tr>
<tr>
<td>(1-13, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-8, 3-4, 3-5, 3-6, 3-7, 3-8, 4-5, 4-7, 4-9, 4-10, 4-12, 5-6, 5-8, 6-13, 7-1, 7-2, 7-3, 7-4, 7-10, 8-1, 8-3)</td>
</tr>
<tr>
<td><strong>4.G.2</strong> Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</td>
</tr>
<tr>
<td>(3-2, 3-4, 7-6, 8-1, 8-4)</td>
</tr>
<tr>
<td><strong>4.G.3</strong> Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</td>
</tr>
<tr>
<td>(3-9, 3-12, 4-10, 6-6, 6-8, 7-6, 7-8, 7-10)</td>
</tr>
</tbody>
</table>
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>1. Make sense of problems and persevere in solving them.</th>
<th>Everyday Mathematics Goals for Mathematical Processes and Practices</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 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.</td>
<td>Pages 11, 33, 42, 45, 46, 47, 48, 49, 53, 54, 55, 57, 59, 60, 61, 62, 63, 65, 66, 67, 72, 74, 75, 80, 81, 97, 98, 139, 151, 153, 154, 155, 157, 158, 161, 163, 165, 167, 169, 171, 195, 221, 222, 223, 224, 225, 229, 230, 247, 249, 250, 251, 253, 254, 265, 337, 339, 343, 347, 349, 350, 351, 352, 353, 355, 356, 357, 359, 371, 372, 373, 374, 375, 383, 395, 396, 397, 398, 399, 401, 402, 403, 404, 405, 441, 443, 444, 447, 459, 465, 472, 475, 477, 478, 517, 520, 527, 549, 550, 553, 556, 557, 558, 559, 569, 571, 572, 573, 575, 576, 577, 588, 594, 596, 597, 599, 615, 617, 623, 676, 677, 678, 679, 681, 684, 685, 687, 691, 692, 693, 694, 695, 697, 698, 700, 701, 716, 717, 721, 753, 754, 755, 757, 765, 766, 768, 769, 771, 772, 773, 779, 789, 795, 796, 805, 806, 807, 812, 813, 815, 817, 823, 825, 826, 828, 831, 832, 834</td>
</tr>
</tbody>
</table>
### Mathematical Processes and Practices

<table>
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<th>Every Day Mathematics Goals for Mathematical Processes and Practices</th>
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</thead>
<tbody>
<tr>
<td><strong>3. Construct viable arguments and critique the reasoning of others.</strong></td>
</tr>
<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>
</tr>
</tbody>
</table>

| **4. Model with mathematics.** |
| Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose. |
### 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.


### Everyday Mathematics Goals for Mathematical Processes and Practices

#### 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.

### Mathematical Processes and Practices

#### 7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see $7 \times 8$ 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 that its value cannot be more than $5$ for any real numbers $x$ and $y$.

#### 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 $\left(\frac{y - 2}{x - 1}\right) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process and practice, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

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<table>
<thead>
<tr>
<th><strong>Everyday Mathematics Goals for Mathematical Processes and Practices</strong></th>
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<table>
<thead>
<tr>
<th><strong>Pathway to Mastery</strong></th>
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</table>
Mastery Expectations

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

- Understanding and fluency with multi-digit multiplication, and understanding of dividing to find quotients with multi-digit dividends.
- Understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.
- Understanding that geometric figures can be analyzed and classified based on their properties.

<table>
<thead>
<tr>
<th>Standards</th>
<th>First Quarter: Benchmark Expectations for Units 1 and 2</th>
<th>Second Quarter: Benchmark Expectations for Units 3 and 4</th>
<th>Third Quarter: Benchmark Expectations for Units 5 and 6</th>
<th>Fourth Quarter: Benchmark Expectations for Units 7 and 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.OA.1</td>
<td>Recognize comparison situations that are multiplicative.</td>
<td>Interpret a multiplication equation as a multiplicative comparison and represent statements of multiplicative comparisons as multiplication equations. (Does not address division.)</td>
<td>⭐ Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 \times 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>4.OA.2</td>
<td>Identify a number story as additive or multiplicative and explain how they know.</td>
<td>Solve multiplicative comparison number stories using multiplication.</td>
<td>⭐ Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>4.OA.3</td>
<td>Solve addition and subtraction multistep number stories. Articulate a plan for solving addition and subtraction multistep number stories. Assess the reasonableness of answers to addition and subtraction multistep number stories by comparing them to an estimate.</td>
<td>Make sense of multistep number stories involving addition, subtraction and multiplication. Articulate a plan for solving addition, subtraction and multiplication multistep number stories. Assess the reasonableness of answers to addition, subtraction and multiplication multistep number stories by comparing them to an estimate.</td>
<td>Solve multistep addition, subtraction and multiplication number stories.</td>
<td>⭐ Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</td>
</tr>
<tr>
<td>Standards</td>
<td>First Quarter</td>
<td>Second Quarter</td>
<td>Third Quarter</td>
<td>Fourth Quarter</td>
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<tr>
<td><strong>4.OA.4</strong></td>
<td><strong>Identify more than one factor pair for composite numbers less than 40.</strong></td>
<td><strong>Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.</strong></td>
<td></td>
<td><strong>Ongoing practice and application.</strong></td>
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<tr>
<td></td>
<td><strong>Write multiples of a 1-digit number.</strong> <strong>Identify prime and composite numbers less than 40.</strong></td>
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<tr>
<td><strong>4.OA.5</strong></td>
<td><strong>Apply an addition, subtraction, multiplication, or division rule to a “What’s My Rule?” table and extend simple shape patterns. Predict the features of the next number or shape.</strong></td>
<td><strong>Apply an addition, subtraction, multiplication, or division rule to a “What’s My Rule?” table and extend simple shape patterns. Identify simple number or shape patterns that were not explicit in the original rule.</strong></td>
<td><strong>Apply an addition, subtraction, multiplication, or division rule to a “What’s My Rule?” table and extend simple shape patterns. Identify simple number or shape patterns that were not explicit in the original rule.</strong></td>
<td><strong>Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</strong></td>
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<td></td>
<td><strong>Ongoing practice and application.</strong></td>
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<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>
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<tr>
<td><strong>4.NBT.2</strong></td>
<td>Read and identify places in numbers through the hundred thousands. Read number names through the hundred thousands. Read numbers in expanded form through hundred thousands and write numbers in expanded form through thousands. Compare and order multidigit whole numbers through hundred thousands to the thousands place or larger. Record multidigit whole-number comparisons using &gt;, &lt;, or = through hundred thousands to the thousands place or larger.</td>
<td>★ Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using &gt;, = and &lt; symbols to record the results of comparisons.</td>
<td>Ongoing practice and application.</td>
<td></td>
</tr>
<tr>
<td><strong>4.NBT.3</strong></td>
<td>Round numbers through the hundred thousands to the thousands place or larger.</td>
<td>★ Use place value understanding to round multi-digit whole numbers to any place.</td>
<td>Ongoing practice and application.</td>
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</tr>
<tr>
<td><strong>4.NBT.4</strong></td>
<td>Use U.S. Traditional addition to solve 4-digit + 4-digit problems. Use U.S. Traditional subtraction to solve 4-digit – 4-digit problems but not explain.</td>
<td>★ Fluently add and subtract multi-digit whole numbers using the standard algorithm.</td>
<td>Ongoing practice and application.</td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>First Quarter</td>
<td>Second Quarter</td>
<td>Third Quarter</td>
<td>Fourth Quarter</td>
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<tr>
<td>4.NBT.5</td>
<td>Use fact extensions to multiply by a multiple of 10.</td>
<td>Accurately multiply 2-digit by 1-digit whole numbers. Use fact extensions to multiply by a multiple of 10.</td>
<td>Accurately multiply a 3-digit number by a 1-digit number and 2-digit numbers by a multiple of 10. Illustrate and explain multiplication by a 1-digit number. Use fact extensions to multiply by a multiple of 10, 100, or 1,000.</td>
<td>✨ Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</td>
</tr>
<tr>
<td>4.NBT.6</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Accurately divide a 2-digit number by a 1-digit number and illustrate. Explain division of a 2-digit number by a 1-digit number.</td>
<td>✨ Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</td>
</tr>
<tr>
<td>4.NF.1</td>
<td>No expectations of mastery at this point.</td>
<td>Explain why any two fractions through 12ths are equivalent using a model. Identify that the number and size of the parts differ in equivalent fractions through 12ths.</td>
<td>✨ Explain why a fraction ( \frac{a}{b} ) is equivalent to a fraction ( \frac{(n \times a)}{(n \times b)} ) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</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

<table>
<thead>
<tr>
<th>Standards</th>
<th>First Quarter Benchmark Expectations for Units 1 and 2</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>4.NF.2</strong></td>
<td>No expectations of mastery at this point.</td>
<td>Use a visual model to recognize that comparing fractions with different denominators is comparing a different number of shares within the same whole. Compare and order fractions using a model. Record fraction comparisons using $&gt;$, $\leq$, or $&lt;$. Justify comparisons of fractions with different denominators using a visual model.</td>
<td>$\star$ Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $&gt;$, $\leq$, or $&lt;$, and justify the conclusions, e.g., by using a visual fraction model.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td><strong>4.NF.3</strong></td>
<td>No expectations of mastery at this point.</td>
<td>See the mastery expectation statements for the substandards for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.</td>
<td>See the mastery expectation statements for the substandards for this standard. Students who are meeting expectations for all of the substandards are meeting expectations for this standard.</td>
<td>$\star$ Understand a fraction $\frac{a}{b}$ with $a &gt; 1$ as a sum of fractions $\frac{1}{b}$.</td>
</tr>
<tr>
<td><strong>4.NF.3a</strong></td>
<td>No expectations of mastery at this point.</td>
<td>Join and separate parts referring to the same whole.</td>
<td>Join and separate parts referring to the same whole. Add fractions with like denominators using manipulatives. Subtract fractions with like denominators using manipulatives.</td>
<td>$\star$ Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</td>
</tr>
<tr>
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<tr>
<td>4.NF.3b</td>
<td>No expectations of mastery at this point.</td>
<td>Decompose fractions and represent decompositions with an equation. Explain the decomposition by using a visual fraction model.</td>
<td>♠ Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.</td>
<td>Ongoing practice and application.</td>
</tr>
<tr>
<td>4.NF.3c</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Add mixed numbers with like denominators using manipulatives and visual fraction models. Subtract mixed numbers with like denominators using manipulatives and visual fraction models.</td>
<td>♠ Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</td>
</tr>
<tr>
<td>4.NF.3d</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Add and subtract fractions in number stories using manipulatives and visual fraction models.</td>
<td>♠ Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</td>
</tr>
<tr>
<td>4.NF.4</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>See the mastery expectation statements for the substandards 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 multiplication to multiply a fraction by a whole number.</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>
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<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.NF.4a</strong></td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Apply understanding of repeated addition and multiplication to work with unit fractions.</td>
<td>Understand a fraction $a/b$ as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.</td>
</tr>
<tr>
<td><strong>4.NF.4b</strong></td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Solve problems involving multiplying a fraction by a whole number using repeated addition.</td>
<td>Understand a multiple of $a/b$ as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)</td>
</tr>
<tr>
<td><strong>4.NF.4c</strong></td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Represent a word problem involving multiplication of a fraction by a whole number using addition.</td>
<td>Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be $5$ people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</td>
</tr>
<tr>
<td><strong>4.NF.5</strong></td>
<td>No expectations of mastery at this point.</td>
<td>Understand that fractions with a denominator 10 can also be expressed as a fraction with denominator 100.</td>
<td>Add two fractions with denominators 10 and 100 using a model.</td>
<td>Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.</td>
</tr>
</tbody>
</table>
### Standards

#### First Quarter

<table>
<thead>
<tr>
<th>Benchmark Expectations for Units 1 and 2</th>
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</thead>
<tbody>
<tr>
<td>No expectations of mastery at this point.</td>
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</table>

#### Second Quarter

<table>
<thead>
<tr>
<th>Benchmark Expectations for Units 3 and 4</th>
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</thead>
<tbody>
<tr>
<td>Represent decimals to hundredths using a preferred model. Represent decimals to the hundredths with base-10 numerals. Attempt to translate between decimal notation and fractions with denominators 10 or 100 without a model.</td>
</tr>
</tbody>
</table>

#### Third Quarter

<table>
<thead>
<tr>
<th>Benchmark Expectations for Units 5 and 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌟 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</td>
</tr>
</tbody>
</table>

#### Fourth Quarter

<table>
<thead>
<tr>
<th>Benchmark Expectations for Units 7 and 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing practice and application.</td>
</tr>
</tbody>
</table>

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#### 4.NF.6

- No expectations of mastery at this point.
- Represent decimals to hundredths using a preferred model.
- Represent decimals to the hundredths with base-10 numerals.
- Attempt to translate between decimal notation and fractions with denominators 10 or 100 without a model.

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

- Ongoing practice and application.

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#### 4.NF.7

- No expectations of mastery at this point.
- Recognize that decimal comparisons require same-size wholes using a concrete model.
- Compare and order using a model.
- Record decimal comparisons.
- Justify comparisons of decimals using a model.

- Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

- Ongoing practice and application.

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#### 4.MD.1

- Express conversions of time and customary units of length in a 2-column table and explain the relationship.
- Express conversions of length, time, capacity and mass in a 2-column table and explain the relationship.
- Express conversions of length, time, capacity, mass and weight in a 2-column table and explain the relationship.

- Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24); (3, 36);...
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<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.MD.2</td>
<td>Solve number stories involving customary units of length and units of time.</td>
<td>Solve number stories involving customary units of length, time, money, and metric units of length, capacity, and mass. Solve number stories involving metric units of length involving simple fractions or decimals.</td>
<td>Solve number stories involving customary units of length and weight, units of time, money, and metric units of length, capacity, and mass. Solve number stories involving metric units of length involving simple fractions or decimals.</td>
<td>Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</td>
</tr>
<tr>
<td>4.MD.3</td>
<td>Find the perimeter using a strategy. Find the area using a strategy.</td>
<td>Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. Ongoing practice and application.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.MD.4</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Organize and represent data in fractions of a unit (1/2 and 1/4) on line plots. Solve addition and subtraction problems involving halves and quarters of a unit by using the information presented in a line plot.</td>
<td>Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</td>
</tr>
</tbody>
</table>
### Standards

<table>
<thead>
<tr>
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<th>Fourth Quarter Benchmark Expectations for Units 7 and 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.MD.5</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>See the mastery expectation statements for the substandards for this standard and for standard 4.G.1. Students who are meeting expectations for all of the substandards and 4.G.1 are meeting expectations for this standard.</td>
<td>★ Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</td>
</tr>
<tr>
<td>4.MD.5a</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Identify benchmark rotations such as $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and full turns. Understand the degree as an angle that is $\frac{1}{360}$ of a circle.</td>
<td>★ An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $1/360$ of a circle is called a “one-degree angle,” and can be used to measure angles.</td>
</tr>
<tr>
<td>4.MD.5b</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Recognize that angles are measured in iterations of one-degree angles.</td>
<td>★ An angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.</td>
</tr>
<tr>
<td>4.MD.6</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Measure angles within a given range after estimating angle. When given one ray, sketch an angle.</td>
<td>★ Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</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>
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<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.MD.7</td>
<td>No expectations of mastery at this point.</td>
<td>No expectations of mastery at this point.</td>
<td>Expect students to recognize angle measures as additive within benchmark angles measuring 90- and 180-degrees. Add and subtract to find unknown angle measures within benchmark angles measuring 90- and 180-degrees.</td>
<td>★ Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</td>
</tr>
<tr>
<td>4.G.1</td>
<td>Draw and label points, lines, line segments, and rays with help from the Student Reference Book. Correctly identify right angles.</td>
<td>Identify lines, line segments, and rays alone or within figures. Draw and represent right angles and identify other angles as acute or obtuse. Draw, represent, and identify perpendicular and parallel lines.</td>
<td>★ Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</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>4.G.2</td>
<td>Identify properties of line segments and angles within quadrilaterals. Identify right angles within triangles.</td>
<td>★ Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</td>
<td>Ongoing practice and application.</td>
<td></td>
</tr>
<tr>
<td>4.G.3</td>
<td>Identify at least one line of symmetry in two-dimensional symmetric figures.</td>
<td>Attempt to use a line of symmetry to draw a complete figure. Identify at least one line of symmetry in two-dimensional symmetric figures.</td>
<td>Recognize that a line of symmetry divides a figure into two matching parts. Identify line symmetric and non-line symmetric figures.</td>
<td>★ Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</td>
</tr>
</tbody>
</table>
## Focus

In Unit 1, students explore place-value concepts for multidigit whole numbers.

### Major Clusters

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.A** Generalize place value understanding for multi-digit whole numbers.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit numbers.

### Supporting Clusters

- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

## Unit 1 Place Value; Multidigit Addition and Subtraction

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<th>Section</th>
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<td>Formal Procedures for Rounding</td>
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<td>U.S. Traditional Addition</td>
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<td><strong>Open Response</strong> Cracking the Muffin Code</td>
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<tr>
<td>1-14</td>
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<td>102</td>
</tr>
</tbody>
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### Focus

In **Unit 2**, students explore various applications for multiplication. They classify shapes by properties and develop formulas for finding the area of a rectangle.

#### Major Clusters

- **4.OA.A**: Use the four operations with whole numbers to solve problems.
- **4.OA.B**: Gain familiarity with factors and multiples.
- **4.NBT.B**: Use place value understanding and properties of operations to perform multi-digit arithmetic.

#### Supporting Clusters

- **4.MD.A**: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.G.A**: Draw and identify lines and angles, and classify shapes by properties of their lines and shapes.

### Unit 2: Multiplication and Geometry

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<td>2.5 Prime and Composite Numbers</td>
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<td><strong>Open Response</strong> 2.6 Little and Big</td>
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<td>2.7 Units of Time</td>
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<td>2.8 Multiplicative Comparisons</td>
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<td>2.11 Classifying Quadrilaterals</td>
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<td><strong>Assessment</strong> 2.14 Unit 2 Progress Check</td>
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</tr>
</tbody>
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### Focus

In **Unit 3**, students explore fraction equivalence and compare and order fractions using different representations. They then extend their understanding of fractions to decimals, comparing and ordering decimals using the same method as for comparing fractions.

#### Major Clusters

- **4.NF.A**: Extend understanding of fraction equivalence and ordering.
- **4.NF.B**: Understand decimal notation for fractions, and compare decimal fractions.

#### Supporting Clusters

- **3.1** Equal Sharing and Equivalence
- **3.2** Fraction Circles and Equivalence
- **3.3** Number Lines and Equivalence
- **3.4** An Equivalent Fractions Rule
- **Open Response** 3.5 Veggie Pizzas
- **3.6** Comparing Fractions
- **3.7** Comparing and Ordering Fractions
- **3.8** Modeling Tenths with Fraction Circles
- **3.9** Modeling Decimals with Base-10 Blocks
- **3.10** Tenths and Hundredths
- **3.11** Tenths and Hundredths of a Meter
- **3.12** Tenths of a Centimeter
- **3.13** Comparing Decimals
- **Assessment** 3.14 Unit 3 Progress Check

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### Contents
In Unit 4, students are introduced to the basic principles of multidigit multiplication by focusing on extending multiplication skills and exploring the partial-products method. They also use their knowledge of multiplication to find area and convert measurements.

**Major Clusters**
- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.

**Supporting Clusters**
- **4.OA.B** Gain familiarity with factors and multiples.
- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

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**Focus**

In Unit 5, students explore the whole in fractions as well as adding and subtracting fractions and mixed numbers. Students use these computation skills to answer questions about line plots. They are also introduced to adding tenths and hundredths. Students build on their knowledge of rays to explore unit iteration for angles.

**Major Clusters**
- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

---

**Unit 4**  **Multidigit Multiplication**  
- **4-1** Extended Multiplication Facts  
- **4-2** Making Reasonable Estimates for Products  
- **4-3** Partitioning Rectangles  
- **4-4** Converting Liquid Measures  
- **4-5** **Open Response** Walking Away with a Million Dollars  
- **4-6** Introducing Partial-Products Multiplication  
- **4-7** Metric Units of Mass  
- **4-8** Money Number Stories  
- **4-9** Partial-Products Multiplication  
- **4-10** **Multiplication Wrestling**  
- **4-11** Area Models for Rectangles and Rectilinear Figures  
- **4-12** Multistep Multiplication Number Stories  
- **4-13** Lattice Multiplication  
- **4-14** **Assessment** Unit 4 Progress Check

**Unit 5**  **Fraction and Mixed-Number Computation; Measurement**
- **5-1** Fraction Decomposition  
- **5-2** The Whole for Fractions  
- **5-3** Adding Fractions  
- **5-4** Adding Mixed Numbers  
- **5-5** Adding Tenths and Hundredths  
- **5-6** **Open Response** Queen Arlene’s Dilemma  
- **5-7** Subtracting Fractions  
- **5-8** Subtracting Mixed Numbers  
- **5-9** Line Plots: Fractional Units  
- **5-10** Rotations and Iterating Angles  
- **5-11** Unit Iteration for Angles  
- **5-12** Creating Symmetric Figures  
- **5-13** More Multistep Multiplication Number Stories  
- **5-14** **Assessment** Unit 5 Progress Check
Focus

In Unit 6, students explore the relationship between multiplication and division by developing a method for dividing whole numbers and solving division number stories. They are introduced to protractors and explore using them to measure and construct angles.

Major Clusters
4.OA.A Use the four operations with whole numbers to solve problems.

4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NF.B Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Supporting Clusters
4.OA.B Gain familiarity with factors and multiples.

4.OA.C Generate and analyze patterns.

4.MD.C Geometric measurement: understand concepts of angle and measure angles.

Unit 6 Division: Angles

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<td>Number Stories with Fractions and Mixed Numbers</td>
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<td>6-13</td>
<td>Extending Understandings of Whole-Number Multiplication</td>
</tr>
<tr>
<td>6-14</td>
<td><strong>Assessment</strong> Unit 6 Progress Check</td>
</tr>
</tbody>
</table>
In Unit 7, students formalize their understanding of multiplying a fraction by a whole number and use this knowledge to solve problems in real-world scenarios.

**Major Clusters**
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- **4.NF.C** Understand decimal notation for fractions, and compare decimal fractions.

**Supporting Clusters**
- **4.OA.C** Generate and analyze patterns.
- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.MD.B** Represent and interpret data.

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**Focus**

In Unit 8, students apply their knowledge of fractions, number concepts, patterns, and geometry to different real-world scenarios.

**Major Clusters**

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.A** Generalize place value understanding for multi-digit whole numbers.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

**Supporting Clusters**

- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.MD.B** Represent and interpret data.
- **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

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**Glossary**

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**Unpacking the Mathematics Standards**

- **Content Standards**
  - EM1
  - EM3
  - EM8

- **Process and Practice Standards**
  - EM12

**Grades 3–4 Games Correlation**

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**Children’s Work Samples**

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**Evaluated Children’s Work Samples**

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Unit 2 Organizer

Multiplication and Geometry

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*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 various applications for multiplication. They classify shapes by properties and develop formulas for finding the area of a rectangle.

Major Clusters

4.OA.A Use the four operations with whole numbers to solve problems.
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.

Supporting Clusters

4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
4.G.A Draw and identify lines and angles, and classify shapes by properties of their lines and shapes.

Process and Practice Standards

SMP6 Attend to precision.
SMP7 Look for and make use of structure.

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.

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<th>Links to the Past</th>
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<tr>
<td>4.OA.1 In Grade 3, students use arrays, drawings, equal groupings, and other strategies to solve number stories involving multiplicative situations.</td>
<td></td>
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<tr>
<td>4.OA.2 In Grade 3 and in Unit 1, students solve number stories involving additive comparisons, using drawings and equations.</td>
<td>Students will encounter multiplicative comparisons in practice activities. Students model multi-step number stories and real-world contexts using expressions with grouping symbols throughout Grade 5.</td>
</tr>
<tr>
<td>4.OA.4 In Grade 3, students learn multiplication and division facts using a variety of strategies. They begin to use arrays, fact families, patterns, skip counting, and equal grouping to discover factor pairs of numbers less than 100.</td>
<td>Students will continue to solve number stories involving multiplicative comparisons in different contexts. In Unit 5, students revisit multiplicative-comparison number stories involving whole numbers. In Unit 7, students work with fractions as they solve number stories involving multiplicative comparisons. Students will regularly use factors and multiples in numbers stories, problems, and games. In Unit 3, students use factors and multiples in finding equivalent fractions. In Unit 6, factors are used as students learn partial-quotient division. In later grades, students find greatest common factors and least common multiples.</td>
</tr>
<tr>
<td>4.OA.5 In Grade 4, students developed a rule for solving multiplication problems involving... Students use number patterns to solve the open-response problem in Unit 1. In Grade 3, students identify patterns in the multiplication table and relate them to multiplication strategies and properties of multiplication. multiples of 10.</td>
<td></td>
</tr>
<tr>
<td>4.G.2 In Unit 1, students use properties of rectangles to develop formulas for the perimeter of rectangles. In Grade 3, students sort and describe polygons based upon their attributes and identify subcategories of quadrilaterals and triangles.</td>
<td></td>
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<tr>
<td></td>
<td>In Unit 3, students look for patterns in sets of equivalent fractions and develop a rule for finding equivalent fractions. In Units 6 and Unit 7, they develop rules involving geometric patterns and figurate numbers. In Grade 5, students use rules, tables, and graphs to extend patterns and solve real-world problems. Students review properties of right triangles and other polygons in Unit 3. In Unit 4, students explore properties of rectilinear figures. In Grade 5, students use properties of triangles to create a triangle hierarchy.</td>
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## Planning for Rich Math Instruction

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**Multiplication equations as comparisons**<br>Sharing Comparison Statements, pp. 168–169

**Conceptual Understanding**

**Rigor**

**Procedural Skill and Fluency**

**Applications**

**Rich Tasks and Mathematical Reasoning**

**Mathematical Discourse**

**Distributed Practice**

**Differentiation Support**

**Red text = Game**
# Planning for Rich Math Instruction

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Red text = Game
Lesson 2-14 is an assessment lesson. It includes:

- Self Assessment
- Unit Assessment
- Optional Challenge assessment
- Cumulative Assessment
- Suggestions for adjusting the assessments
# Unit 2 Materials

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<td>per partnership: number cards 0–9 (4 of each), counters; per group: 40 centimeter cubes</td>
<td>slate; per partnership: calculator; scissors; tape</td>
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<td>2-2</td>
<td>pp. 54–57; TA11; G3–G6; G11–G14</td>
<td>18</td>
<td>centimeter cube; centimeter ruler; 6-sided die; 36 square pattern blocks; number cards 0–9 (4 of each)</td>
<td>slate; scissors; colored pencils; paper; straightedge</td>
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<tr>
<td>2-3</td>
<td>pp. 58–59; G7; G15–G17, G19</td>
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<td>centimeter cubes; number cards 2–9 (4 of each); counters</td>
<td>slate; calculator</td>
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<td>2-4</td>
<td>pp. 58; 60–61; TA13, G18</td>
<td>19</td>
<td>chips or counters; centimeter cubes; number cards 2–10 (2 of each)</td>
<td>slate</td>
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<tr>
<td>2-5</td>
<td>pp. 62–64; TA14–TA15; G19</td>
<td>20–21</td>
<td>counters; number cards 2–9 (4 of each); centimeter cubes</td>
<td>slate; colored pencils or crayons</td>
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<td>2-6</td>
<td>pp. 65–66; 67 (optional); 68; TA8</td>
<td></td>
<td>Standards for Mathematical Practice Poster; 10 small (1 1_4 in.) paper clips; Guidelines for Discussion Poster; scissors, glue, colored pencils (optional); selected samples of students’ work; students’ work from Day 1</td>
<td></td>
</tr>
<tr>
<td>2-7</td>
<td>pp. 69–70; TA9</td>
<td>22</td>
<td>analog clock with second hand; calculator; slate; paper</td>
<td></td>
</tr>
<tr>
<td>2-8</td>
<td>pp. 71–74; TA16; G15–G16</td>
<td></td>
<td>counters</td>
<td>slate; calculator; scissors; paper clips</td>
</tr>
<tr>
<td>2-9</td>
<td>pp. 75–77; TA17; G20–G21</td>
<td></td>
<td>6-sided die</td>
<td>slate</td>
</tr>
<tr>
<td>2-10</td>
<td>pp. 78–79; G11–G14</td>
<td>23</td>
<td>fraction circles; Geometry Template*</td>
<td>slate; paper; geometry kits (see Before You Begin in Lesson 1-12)</td>
</tr>
<tr>
<td>2-11</td>
<td>pp. 80–82; TA18–TA19; G2–G4; G22–G26</td>
<td>24</td>
<td>geoboard; rubber bands; number cards 0–9 (4 of each); Geometry Template*</td>
<td>slate; straightedge; scissors; Geometry Concentration Cards from Lessons 1-11 and 1-12 (optional)</td>
</tr>
<tr>
<td>2-12</td>
<td>pp. 83–88; G20–G21</td>
<td>25</td>
<td>6-sided die; pattern blocks; Geometry Template*</td>
<td>slate; scissors; straightedge; paper</td>
</tr>
<tr>
<td>2-13</td>
<td>pp. 89–90; TA20–TA21</td>
<td>26–27</td>
<td>pattern blocks</td>
<td>slate; calculator (optional); paper</td>
</tr>
<tr>
<td>2-14</td>
<td>pp. 91–96; Assessment Handbook, pp. 12–19</td>
<td></td>
<td>fraction circles</td>
<td></td>
</tr>
</tbody>
</table>

**Literature Link** Optional Books: 2-13 Two of Everything

**Go Online** for a complete literature list in Grade 4.
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>Processes and Practices</th>
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<td>2-1</td>
<td>Use multiplication to generate square number patterns.</td>
<td>4.NBT.5</td>
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<tr>
<td>2-2</td>
<td>Find the area of a rectangle.</td>
<td>4.NBT.5, 4.MD.3</td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>Find at least two factors for 2-digit numbers.</td>
<td>4.OA.4, 4.NBT.5</td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>Identify multiples of numbers other than 10.</td>
<td>4.OA.4, 4.NBT.5</td>
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<tr>
<td>2-5</td>
<td>Identify factors of a number in the 1–39 range.</td>
<td>4.OA.4, 4.NBT.5</td>
<td></td>
</tr>
<tr>
<td>2-6</td>
<td>Use multiplicative reasoning to make a correct prediction.</td>
<td>4.OA.2</td>
<td>SMP3</td>
</tr>
<tr>
<td>2-7</td>
<td>Convert hours to minutes and minutes to seconds.</td>
<td>4.MD.1</td>
<td></td>
</tr>
<tr>
<td>2-8</td>
<td>Use equations to make multiplicative comparisons.</td>
<td>4.OA.1, 4.NBT.5</td>
<td></td>
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<tr>
<td>2-9</td>
<td>Determine whether a comparison is additive or multiplicative.</td>
<td>4.OA.1, 4.OA.2</td>
<td></td>
</tr>
<tr>
<td>2-10</td>
<td>Identify right angles.</td>
<td>4.G.2</td>
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<tr>
<td>2-11</td>
<td>Identify the properties of polygons.</td>
<td>4.G.2, SMP7</td>
<td></td>
</tr>
<tr>
<td>2-12</td>
<td>Identify line symmetry in shapes.</td>
<td>4.G.3</td>
<td></td>
</tr>
<tr>
<td>2-13</td>
<td>Solve “What’s My Rule?” tables.</td>
<td>4.OA.5, 4.NBT.4, 4.NBT.5</td>
<td>SMP7</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 4 Unit 2 Planning Webinar**

This webinar provides a preview of the lessons and content in this section. Watch this video with your grade-level colleagues and plan together under the guidance of an Everyday Mathematics author.

**Big and Little: An Open Response and Reengagement Lesson**

Watch one classroom work through an Open Response and Reengagement lesson. Explore the introduction and reengagement in practice.

**A Teacher’s Perspective on Algorithms in EM**

After teaching a lesson on multi-digit algorithms, a fourth-grade teacher explains how she approaches teaching new algorithms to students.

For more resources, go to the VLC Resources page and search for Grade 4.
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

#### 4.OA.1

- **Progress Towards Mastery**  By the end of Unit 2, expect students to recognize comparison situations that are multiplicative.

  **Full Mastery of** 4.OA.1  expected by the end of Unit 6.

#### 4.OA.2

- **Progress Towards Mastery**  By the end of Unit 2, expect students to identify a number story as additive or multiplicative and explain how they know.

  **Full Mastery of** 4.OA.2  expected by the end of Unit 6.

#### 4.OA.4

- **Progress Towards Mastery**  By the end of Unit 2, expect students to identify more than one factor pair for composite numbers less than 40, write multiples of a 1-digit number, and identify prime and composite numbers less than 40.

  **Full Mastery of** 4.OA.4  expected by the end of Unit 4.
Progress Towards Mastery By the end of Unit 2, expect students to use the U.S. traditional addition and subtraction algorithms to solve 4-digit + 4-digit and 4-digit − 4-digit problems.

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

Progress Towards Mastery By the end of Unit 2, expect students to use fact extensions to multiply by a multiple of 10.

Full Mastery of 4.NBT.5 expected by the end of Unit 8.

Progress Towards Mastery By the end of Unit 2, expect students to identify properties of line segments and angles within quadrilaterals and identify right angles within triangles.

Full Mastery of 5.MD.1 expected by the end of Unit 4.

Progress Towards Mastery By the end of Unit 2, expect students to identify at least one line of symmetry in 2-dimensional symmetric figures.

Full Mastery of 4.G.3 expected by the end of Unit 8.

Key

- Assessment Check-in
- Progress Check Lesson
- Current Unit
- Previous or Upcoming Lessons
Mathematical Background: Content

▶ Multiplication and Multiplicative Comparison
(Lessons 2-1, 2-3 through 2-6, 2-8, and 2-9)

In Unit 2 students work with multiplication in a variety of different contexts. Arrays have been featured as “pictures” of products since Second Grade Everyday Mathematics. For multiplication, the number of rows and the number of columns in an array are factors, and the total number of objects in the array is the product. (See margin.)

What may be new to fourth graders in Lesson 2-1 is linking arrays to square numbers, or numbers for which arrays have the same number of rows and columns. 4.NBT.5 In Lesson 2-3 students are introduced to the concept of factors and factor pairs. Factors are numbers that are multiplied together, and factors have many applications. The terms prime number, composite number, and square number are all defined in terms of their factors. Lesson 2-4 introduces the concept of multiples. A multiple of a number is the product of that number and some other whole number. Every multiple of a number is evenly divisible by its factors. 4.OA.4 Students extend their understanding of factors and multiples in Lesson 2-5 as they examine prime and composite numbers. 4.OA.4

In Lessons 2-6, 2-8, and 2-9 students learn to interpret multiplication equations as multiplicative comparisons, and conversely, to represent statements of multiplicative comparisons as multiplication equations. 4.OA.1 The concept of multiplicative comparison becomes more accessible in context, as in the following number story: Jane has 3 pretzels. Jack has 4 times as many pretzels as Jane. How many pretzels does Jack have? Multiplicative comparison problems contain two quantities: in this problem, Jane’s set of pretzels and Jack’s set of pretzels. The two quantities are related to each other: one quantity is a number of times as large as the other. 4.OA.2 The unknown quantity can be determined from the comparison. Students’ work with multiplicative comparisons lays the groundwork for future study of algebra.

Students play games to practice multiplication skills in various contexts. Factor Captor and Factor Bingo both involve identifying factors of whole numbers 1–100. Buzz and Bizz-Buzz helps students identify multiples of given 1-digit numbers. How Much More? provides practice interpreting multiplicative comparison number stories and differentiating from additive comparison number stories.
Lesson 2-2 explores another application of multiplication, introducing the formula for finding the area of a rectangle. **4.MD.3** It is essential that students understand the concept of area before being introduced to the formula. Lesson 2-2 links conceptual work done in previous grades to a meaningful understanding of why application of the formula results in the value of the area. Working with a diagram of a rectangle divided into unit squares helps students see the one-to-one correspondence between the number of squares in a row and the units measuring the length of the rectangle, as well as the correspondence between width and the number of columns. (See margin)

By following the conceptual development of formulas, students gain insight into the ideas and relationships behind them. This understanding in turn makes it less likely for students to confuse area and perimeter, or to select the wrong formula to apply to a given problem. Students who understand where formulas come from are more likely to remember them, and understanding reinforces the idea that mathematics makes sense.

Students play *Rugs and Fences* to practice using formulas for finding area and perimeter in the context of real-world and mathematical examples. **4.MD.1, 4.MD.3**
Geometry (Lessons 2-10 through 2-12)

In Unit 2 students build on their knowledge of geometric attributes and begin classifying shapes according to properties. Geometry instruction at this level relies heavily on vocabulary, so students must be adept in their use of key words. Frequently review vocabulary introduced in Unit 1, including acute, right, and obtuse angle, and parallel line segment. Vocabulary can be reviewed quickly in a variety of ways, such as having students use gestures to demonstrate different types of angles or represent each property in a sketch.

In Lesson 2-10 students review common properties of triangles and construct them, focusing on types of angles: right, obtuse, and acute. 4.G.2 They discover that a triangle can only have one right angle.

In Lesson 2-11 students classify quadrilaterals based on whether they have parallel lines. 4.G.2 Sorting by pairs of parallel sides may not occur to most students, as the concept of parallel is relatively new and abstract. It may help to focus on parallel sides as a property. For example, find groups of quadrilaterals that do not all fit into any one classification related to one property, and ask whether all of them would fit according to a different property. If the only shared property is the number of pairs of parallel sides, sorting by pairs of parallel sides is the only method that will accommodate all of them.

In Lesson 2-12 students work with line symmetry, in which figures can be divided so that the two halves are mirror images of each other. 4.G.3 Students explore line symmetry by folding and drawing on paper. Looking for lines of symmetry in triangles and quadrilaterals helps them connect the concept of symmetry to their work in Lessons 2-10 and 2-11.

Patterns (Lesson 2-13)

In prior grades, students use function machines and tables of values to study arithmetic operations and rules. Function machines help students visualize how a rule associates each input value with an output value. In fourth grade, students continue this work by solving “What’s My Rule?” problems. In Lesson 2-13 they are given a rule and then fill in inputs, outputs, or combinations of both. Students focus on identifying patterns not stated explicitly in the rule. 4.OA.5 The complexity of the patterns students describe may vary widely. Allow them time to explore patterns in numbers and to share strategies for discovering patterns.
Mathematical Background: 
Process and Practice

See below for some of the ways that students engage in SMP6 Attend to precision and SMP7 Look for and make use of structure through Operations and Algebraic Thinking, Number and Operations in Base Ten, and the other mathematical content of Unit 2.

▶ Standard for Mathematical Process and Practice 6
In Unit 2 students define properties of whole numbers and shapes. The expectation is that in doing so, they use “clear labels, units, and mathematical language.” GMP6.3 Throughout the unit students are asked to label the properties of numbers using appropriate terminology, such as factor, multiple, factor pair, prime, and composite. They are also expected to define and label shapes according to their properties, using the terms parallel, perpendicular, side, angle, acute, obtuse, and right.

In Lesson 2-3 students are expected to clearly identify parts of an array—rows and columns. They identify and label numbers as prime and composite in Lesson 2-5. Lessons 2-11 and 2-12 challenge students to create, sort, and describe shapes according to their properties. These lessons reinforce the importance of using accurate and precise terminology in order to correctly classify shapes.

▶ Standard for Mathematical Process and Practice 7
The majority of the work in Unit 2 addresses whole numbers and their properties. Students “look for and make use of structure” to p o solve problems. GMP7.1 GMP7.2 Students also examine properties of 2-dimensional shapes in the geometry lessons.

In the early lessons in the unit, students explore patterns in arrays and then link arrays to various subsets of whole numbers: even numbers, square numbers, and prime numbers. Patterning with array work begins in Lesson 2-1 as students look at square arrays. In Lesson 2-4 they examine patterns in multiples to explore the idea that a whole number is a multiple of each of its factors. In Lesson 2-5 students classify numbers as prime or composite based on the number of factors. Lessons 2-11 and 2-12 have students building and sorting shapes based on their properties. The unit ends with students exploring number and shape patterns. They are asked to extend patterns and create their own based on given rules.

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

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

**Day 1:** Students use multiplicative reasoning to make predictions based on information in an open response problem and then make mathematical arguments to support their predictions (conjectures).

**Day 2:** Students analyze others’ conjectures and arguments and then revise their own work.

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**Day 1: Open Response**

**Before You Begin**

Solve the open response problem. Consider the reasoning your students may use to make predictions, or conjectures, and how they might construct arguments to support their conjectures. If possible, schedule time to review students' work and plan for Day 2 of this lesson with your grade-level team.

**Vocabulary**

- conjecture
- argument

**Warm Up**

5 min

**Materials**

**Mental Math and Fluency**

Students identify the place value of digits in a given number.

**Focus**

55–65 min

**Math Message**

Students decide whether suggested rules for a “What’s My Rule?” table are correct and make arguments supporting their decisions.

**Making Conjectures and Arguments**

Students use the terms conjecture and argument in a discussion of the “What’s My Rule?” table.

**Solving the Open Response Problem**

Based on information in the problem, students make predictions, or conjectures, about the comparative heights of two dogs, and then make arguments to justify their answers.

**Standards**

**Focus Clusters**

- Use the four operations with whole numbers to solve problems.
- Generate and analyze patterns.

**Getting Ready for Day 2**

Review children’s work and plan discussion for reengagement.

**Go Online**

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

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**my.mheducation.com**
Warm Up 5 min

Mental Math and Fluency
Display 972,681. Ask students to identify the digits in the named places and the values of those digits. Leveled exercises:

- Which digit is in the thousands place? 2
  What is the value of the digit? 2,000
- Which digit is in the ten-thousands place? 7
  What is the value of the digit? 70,000
- Which digit is in the hundred-thousands place? 9
  What is the value of the digit? 900,000

Focus 55–65 min

Math Message
Math Journal 1, p. 47
Complete journal page 47. GMP1.1, GMP1.3, GMP3.1, GMP7.2

Making Conjectures and Arguments
Math Journal 1, p. 47; Student Reference Book, pp. 10–11
WHOLE CLASS  SMALL GROUP  PARTNER  INDEPENDENT

Math Message Follow-Up Have partners share their decisions about each rule and the arguments they made to justify each decision. Remind them that their proposed rule must work in all three rows of the table. Ask: Do you agree with your partner’s arguments? Why or why not? GMP3.1, GMP7.2 Answers vary.

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.
  GMP1.3 Keep trying when your problem is hard.
SMP3 Construct viable arguments and critique the reasoning of others.
  GMP3.1 Make mathematical conjectures and arguments.
SMP7 Look for and make use of structure.
  GMP7.2 Use structures to solve problems and answer questions.

Warm Up 5 min

The focus of this lesson is GMP3.1. A conjecture is a type of prediction based on some given information. An argument is an explanation that supports or refutes the conjecture. In this lesson students make a conjecture about the height of a dog based on information given in the problem and then write an argument to support their thinking.

Go Online for information about SMP3 in the Implementation Guide.

Professional Development

Go Online for information about SMP3 in the Implementation Guide.

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Display 972,681. Ask students to identify the digits in the named places and the values of those digits. Leveled exercises:

- Which digit is in the thousands place? 2
  What is the value of the digit? 2,000
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Focus 55–65 min

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Math Journal 1, p. 47
Complete journal page 47. GMP1.1, GMP1.3, GMP3.1, GMP7.2

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Math Journal 1, p. 47; Student Reference Book, pp. 10–11
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Warm Up 5 min

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Go Online for information about SMP3 in the Implementation Guide.

Professional Development

Go Online for information about SMP3 in the Implementation Guide.
Have students turn to Student Reference Book, pages 10-11. Read the pages together and remind students that today’s Math Message asked them to decide whether someone’s conjectures about the rules for the “What’s My Rule?” table are correct. Use the Student Reference Book pages to discuss the meaning of conjecture and argument as a class. Refer students to the Standards for Mathematical Practice Poster for GMP3.1.

Academic Language Development Help students understand that the terms conjecture and argument go hand in hand. Conjectures should be critiqued, and convincing arguments should be made to either support or refute them. In the latter case, the conjecture should be revised based on what was learned from the argument, and then the cycle begins again. Some helpful descriptions for the word conjecture are “smart guess” and “reasonable prediction.” Some helpful descriptions for the word argument are “using mathematical reasons” and “trying to prove.” Be sure that students understand that a mathematical argument is not like a social argument, disagreement, or verbal fight.

As a class, review students’ conjectures and arguments. Discuss what makes a good argument for each case. For students who struggle verbalizing their explanations, use sentence frames such as the following to help them get started: “The rule is/is not correct because _________.”

GMP3.1

NOTE When testing the rules for each input, use correct mathematical notation to represent each trial input. For example, for the rule “Double the number and subtract 1” with the input number 4, write two number sentences: 2 × 4 = 8 and then 8 − 1 = 7. Do not write: 2 × 4 = 8 − 1 = 7 because, although it follows the language students may use, it is not correct: 2 × 4 does not equal 8 − 1, and 2 × 4 does not equal 7.

Solving the Open Response Problem

Math Masters, pp. 65–66

Distribute Math Masters, pages 65–66 and 10 small paper clips to each student. Read the problem as a class and have partners discuss what the problem is asking them to do. Point out that students’ predictions are their conjectures and their explanations are their arguments.
Explain to students that they will use paper clips to measure a picture of a dog named Little and then use that information to predict the height of another dog named Big. Tell them they can use tables or diagrams as part of their written arguments to support their predictions.

GMP3.1 Listen as partners talk, asking them questions as needed.

For students who struggle making sense of the problem, ask:

- **What was in this picture before the dogs chewed on it?**
  Sample answer: Little and Big were sitting side by side.

- **What do you know about the problem?**
  Sample answer: When Little’s picture was measured using dog treats, he was 2 dog treats high. Big was measured as 6 dog treats high. Big is much larger than Little, so Big should be many more paper clips high.

- **What do you need to do for Problem 1?**
  Sample answer: Measure Little with paper clips

- **Then what do you need to do for Problems 2 and 3?**
  Sample answer: Predict how tall Big was in the picture in paper clips and then show or tell how I figured out the result

- **What is the conjecture?**
  Sample answer: My prediction of Big’s height

- **What is the argument?**
  Sample answer: How I show or tell how I figured out Big’s height

For students who struggle getting started on the mathematics in the problem, ask:

- **How many paper clips tall is Little?**
  Sample answer: 3 paper clips

- **Is Big’s height greater than or less than Little’s height in dog treats? In paper clips?**
  Greater for both

- **How do the paper clips line up with the dog treats?**
  Sample answers: 3 paper clips line up with 2 dog treats; each dog treat lines up with \( \frac{1}{2} \) paper clips.

**Differentiate**

Adjusting the Activity

For students who have trouble manipulating the paper clips, make a paper clip ruler by taping paper clips to a strip of cardboard to make it easier to line them up straight.

**Summarize**

Ask: Did your argument clearly show that your prediction was true? Answers vary. Do you need to revise your prediction? Answers vary. Did you use words, pictures, numbers, or something else? Answers vary.

Collect students’ work so that you can evaluate it and prepare for Day 2.
Planning a Follow-Up Discussion

Review students’ work. Use the Reengagement Planning Form (Math Masters, page TA8) and the rubric on page 156 to plan ways to help students meet expectations for both the content and practice standards. Look for work that shows correct multiplicative reasoning or incorrect additive reasoning. Also look for clearly stated arguments, as well as arguments that need clarification.

Organize the discussion in one of the ways below or in another way you choose. If students’ work is unclear or if you prefer to show work anonymously, rewrite the work for display.

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

1. Display work, such as Student A’s, that shows correct multiplicative reasoning with pictures, tables, calculations, or words to justify a correct answer of 9 paper clips for Big’s height. Ask:
   - What was this student’s prediction? *Big’s height is 9 paper clips.*
   - Summarize this student’s argument or explanation. **GMP1.1, GMP3.1**
     Sample answer: The drawing shows and labels 2 dog treats as “Little’s height” lined up next to 3 paper clips labeled as “Little’s height in paper clips.” A label points to the dog treats and says, “This times three equals Big’s height, so $3 \times 2 = 6$,” and a fourth label points to the line of paper clips and says, “This times three equals Big’s height, so $3 \times 3 = 9$.”
   - How could this student improve the argument? **GMP1.3, GMP3.1**
     Sample answer: It would be clearer if the student labeled all numbers with units, either dog treats or paper clips. The sentences should say, “This (2 dog treats) times three equals Big’s height, so $3 \times 2 = 6$ dog treats. This (3 paper clips) times three equals Big’s height, so $3 \times 3 = 9$ paper clips.”
2. Show work, such as Student B’s, in which a student inappropriately used additive reasoning yet described the approach reasonably well.
   Ask:
   - What was this student’s prediction? Big is 7 paper clips high. Do you agree or disagree? Disagree
   - What do you think this student was thinking? Sample answer: This student thought that since Little was 2 dog treats tall and 3 paper clips tall, this means to “+ 1.” I think the student added 1 to Big’s height of 6 dog treats to get 7 paper clips.
   - How could you help this student better understand the problem? GMP1.1, GMP7.2 Sample answer: We can line up 6 dog treats with paper clips, and then the student would see that more than 7 paper clips are needed to measure Big’s height.

3. Show work, such as Student C’s, in which the student’s prediction is correct, but the argument is not clear. Ask:
   - What is the conjecture, or prediction, in this response? 9 paper clips
   - Is the prediction correct? Yes.
   - What is the argument? Sample answer: The student says that since Little is 3 paper clips tall and Big is 6 dog treats, Big must be $3 + 6 = 9$ paper clips tall.
   - Does the argument support the prediction? Why or why not? GMP3.1 No. It does not make sense to add different things together like 3 paper clips to 6 dog treats to get 9 paper clips.
   - How could this response be improved? GMP1.3, GMP3.1 Sample answer: The student could use paper clips and cutouts of dog treats to see whether the answer makes sense and then revise the answer and explanation.

Planning for Revisions
Have copies of Math Masters, pages 65–66 or extra paper available for students to use in revisions. You might want to ask students to use colored pencils so you can see what they revised.
Little and Big

Overview

Day 2: Students analyze others’ conjectures and arguments and then revise their own work.

Day 2: Reengagement

Before You Begin

Have extra copies of Math Masters, pages 65–66 and some cutouts from page 67 available for students to use as they revise their work.

Focus

50–55 min

Materials

Standards

Focus Clusters

• Use the four operations with whole numbers to solve problems.

SMP1, SMP3, SMP7

Setting Expectations

Students review the open response problem and discuss what a good argument might include. They also review how to discuss others’ work respectfully.

Guidelines for Discussions Poster

Reengaging in the Problem

Students analyze others’ predictions and arguments and think about how multiplication can be used to solve the problem.

selected samples of students’ work

4.OA.1, 4.OA.2

SMP1, SMP3, SMP7

Revising Work

Students revise their predictions and arguments based on what they learned in the reengagement discussion.

Math Masters, pp. 65–66 (optional); colored pencils (optional); students’ work from Day 1

4.OA.1, 4.OA.2

SMP1, SMP3, SMP7

Assessment Check-In

See page 158 and the rubric below.

Expect most students to use multiplicative reasoning to make a correct prediction for the problem identified.

Goal for Mathematical Process and Practice

GMP3.1

Make mathematical conjectures and arguments.

Not Meeting Expectations

Provides an argument in Problem 3 that is inconsistent with the conjecture in Problem 2; or based on additive reasoning (e.g., Big is 7 paper clips tall because you add 1 paper clip to Little’s height in dog treats, so you do the same for Big); or unclear or ambiguous.

Partially Meeting Expectations

Provides an argument in Problem 3 that is consistent with the conjecture in Problem 2 and either describes or shows in a drawing the relationship between paper clips and dog treats; or uses the multiplicative relationship between Big’s and Little’s heights to find Big’s height in paper clips.

Meeting Expectations

Provides an argument in Problem 3 that is consistent with the conjecture in Problem 2 and both describes or shows in a drawing the relationship between paper clips and dog treats (e.g., 2 dog treats = 3 paper clips, or 1 dog treat = 1 1/2 paper clips); and uses the multiplicative relationship between Big’s and Little’s heights to find Big’s height in paper clips (e.g., 3 x 3 or adding 1 1/2 six times).

Exceeding Expectations

Meets expectations using both words and drawings to explain and show: the relationship between paper clips and dog treats; and the use of the multiplicative relationship between Big’s and Little’s heights to find Big’s height in paper clips.

Practice

10–15 min

Math Boxes 2–6

Students practice and maintain skills.

Math Journal 1, p. 48

See page 158.

Home Link 2–6

Homework

Students solve number stories involving multiplication.

Math Masters, p. 68

4.OA.3, 4.NBT.2, 4.NBT.5

SMP4

my.mheducation.com
Revisiting Guidelines for Reengagement

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

Model some of the following sentence frames to show students appropriate language for discussing other students’ work:

- I like how your drawing of dog treats helps me to ________.
- Could you explain what the numbers mean in your ________?
- Something I would like to add to your argument is ________.
- I noticed that ________.

Reviewing the Problem

Review the problem as a class. Remind students that their task was to make a conjecture about Big’s height in paper clips and write an argument to support the conjecture. Ask: What would a good argument include? Sample answers: an explanation of my thinking and how I made my prediction; a drawing of Little and Big comparing their heights in dog treats and paper clips

Explain to students that they are going to make sense of others’ conjectures and arguments and compare others’ arguments to their own.

Reengaging in the Problem

Students reengage in the problem by analyzing and critiquing other students’ work in pairs and in a whole-group discussion. Have students discuss with partners before sharing with the whole group. Guide this discussion based on the decisions you made in Getting Ready for Day 2.
Revising Work

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Pass back students' work from Day 1. Before students revise anything, ask them to examine their responses and decide how to improve them. Ask the following questions one at a time. Have partners discuss their responses and give a thumbs-up or thumbs-down based on their own work.

- Did you predict, or make a conjecture, that Big is 9 paper clips tall?
- Did you make a clear argument using words or drawings that fully support your conjecture? [**GMP3.1, GMP7.2**]

Tell students they now have a chance to revise their work. Tell them to add to their earlier work using colored pencils or to use another sheet of paper, instead of erasing their original work.

Differentiate Adjusting the Activity

Have students who made satisfactory arguments complete an additional problem. Tell them about Middle, another dog in the picture, who was 4 dog treats tall. Ask: What would Middle’s height be in paper clips? [**GMP7.2**]

Ask students to make a table of the three dogs’ heights in dog treats (input) and paper clips (output). A sample table is provided below.

<table>
<thead>
<tr>
<th>Dog’s Name</th>
<th>Height in Treats</th>
<th>Height in Paper Clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Middle</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Big</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

Ask: What is the rule for this table? How do you know? [**GMP3.1, GMP7.2**]

Sample answer: The rule is the number of treats plus half the number of treats gives the height in paper clips. It works in all three boxes: 2 + 1 = 3, 4 + 2 = 6, 6 + 3 = 9.

Summarize Ask students to reflect on their work and revisions. Ask:
Did you need to revise your prediction (conjecture)? How did you improve your argument? [**GMP3.1, GMP3.1**]

Answers vary.

Assessment Check-In [**4.OA.2**]

Collect and review students’ revised work. Expect them to improve their arguments based on the class discussion. For the content standard, expect most students to use multiplicative reasoning to make a correct prediction of 9 paper clips for Big’s height. You can use the rubric on page 156 to evaluate students’ revised work for [**GMP3.1**].

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 the lesson.
Sample Students’ Work—Evaluated
See the sample in the margin. This work meets expectations for the
content standard by showing the use of multiplicative reasoning to predict
Big's height to be 9 paper clips. With revision, the work meets expectations
for the mathematical practice by providing an argument in Problem 3 that
is consistent with the correct answer in Problem 2. The student explains
the relationship between height measured in dog treats and paper clips
(saying that 1 dog treat is $1\frac{1}{2}$ paper clips) and uses the multiplicative
relationship between Little's and Big's heights to determine Big's height in
paper clips: since Big is 6 dog treats tall, you need to find $1 \times 6$ and add that
to 6 halves. If the student had also illustrated these features with diagrams,
the work would exceed expectations.

Go Online for other samples of evaluated students’ work.

3 Practice 10–15 min

Math Boxes 2-6
Math Journal 1, p. 48
WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

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

Home Link 2-6
Math Masters, p. 68
Homework Students solve number stories involving multiplication.

Using Multiplication

9 grapefruits

Sample answer:

4 grapefruits

Sample answer: I know that there are five 3s in 15, so
that means she bought 5 sets of 3 grapefruits. So I
multiplied $2 \times 5$ and got $10$.

Practice

Write these numbers using words:

40,002

10,004

Six hundred forty-one

600,800

Six hundred eighty

4,000,000

0.001

Six million, eighty-nine

4,024

4,024,024

4,024,024,024
Multiplicative Comparisons

Overview: Students create and interpret statements and equations for multiplicative comparisons.

Before You Begin
For the Readiness activity, consider copying the Fact Triangles on Math Masters, page T16 onto cardstock and saving for future lessons.

Vocabulary
comparison statement • quantity • multiplicative comparison statement • multiplicative relationship

Warm Up 5 min
Mental Math and Fluency
Students identify the values of digits.

Focus 30–40 min
Math Message
Students compare two lengths and write statements. Math Masters, p. 71 4.OA.1, 4.NBT.5
Sharing Comparison Statements
Students explore the language and features of multiplicative comparison situations. Math Masters, p. 71 4.OA.1, 4.NBT.5 SMP2
Representing Comparison Statements as Equations
Students describe relationships between quantities and represent them with equations. slate 4.OA.1, 4.NBT.5 SMP1, SMP2
Creating and Interpreting Statements and Equations
Students create and interpret multiplicative comparison statements and equations. Math Journal 1, p. 53 4.OA.1, 4.OA.2, 4.NBT.5 SMP2
Assessment Check-In
See page 171. Expect most students to solve problems involving multiplication facts outside of number stories. Math Journal 1, p. 53 4.OA.1, 4.NBT.5

Practice 15–20 min
Playing Factor Captor
Game Students find factors of larger numbers. Student Reference Book, p. 258; Math Masters, pp. G15–G16; counters; calculator 4.OA.4, 4.NBT.5, 4.NBT.6 SMP7
Math Boxes 2-8
Students practice and maintain skills. Math Journal 1, p. 54 See page 171.
Home Link 2-8
Homework Students create and interpret multiplicative comparison statements and equations. Math Masters, p. 74 4.OA.1, 4.OA.2, 4.NBT.4, 4.NBT.5 SMP1, SMP2

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

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Differentiation Options

### Readiness 5–10 min
- **Whole Class**
- **Small Group**
- **Partner**
- **Independent**

**Reviewing the “Hard” Facts**

- **4.OA.1, 4.NBT.5, SMP6**
- *Math Masters*, p. TA16; scissors; paper clips

For practice with the “harder” multiplication facts, students cut out and practice with the Fact Triangles on *Math Masters*, page TA16.

Encourage partners to use statements like these: “6 times 7 equals what number?” or “What number is 6 times 7?” *GMP6.3*

You may wish to display these written statements for students’ reference.

### Enrichment 10–15 min
- **Whole Class**
- **Small Group**
- **Partner**
- **Independent**

**Comparing Animal Weights**

- **4.OA.1, 4.OA.2, 4.NBT.5, SMP4**
- *Math Masters*, p. 72

To extend work with multiplicative comparisons in real-life contexts, students write multiplication equations representing comparisons based on information about mother and baby animal weights. *GMP4.1*

### Extra Practice 10–15 min
- **Whole Class**
- **Small Group**
- **Partner**
- **Independent**

**Multiplicative Comparisons**

- **4.OA.1, 4.OA.2, 4.NBT.5, SMP1, SMP2**
- *Math Masters*, p. 73

For additional practice with multiplicative comparison statements, students write a multiplicative comparison number story and write equations representing multiplicative comparisons on *Math Masters*, page 73. *GMP1.1, GMP2.3*

### English Language Learner

**Beginning ELL** Prior to the lesson, use Total Physical Response activities with short questions to review the comparison words and phrases that will be used in the lesson. For example, say: *Make a pile with 3 counters. Make a new pile with 3 times as many counters. Point to the pile with more/fewer counters. How many more/fewer? How many times as many? Repeat using other terms like these: x times as much, twice/half as many, x times as far. Include basic comparison words like longer/shorter and bigger/smaller.*

**Differentiation Support** pages are found in the online Teacher’s Center.
Standards and Goals for Mathematical Practice

**SMP1** Make sense of problems and persevere in solving them.
GMP1.1 Make sense of your problem.

**SMP2** Reason abstractly and quantitatively.
GMP2.1 Create mathematical representations using numbers, words, pictures, symbols, gestures, tables, graphs, and concrete objects.
GMP2.3 Make connections between representations.

---

**Warm Up** 5 min

**Mental Math and Fluency**

Display the number 1,754,396. Ask students to identify the digits in certain places and the values of those digits. *Leveled exercises:*

- ○ ○ Which digit is in the ten-thousands place? 5 What is the value of the digit? 50,000
- ○ ○ Which digit is in the hundred-thousands place? 7 What is the value of the digit? 700,000
- ○ ○ ○ Which digit is in the millions place? 1 What is the value of the digit? 1,000,000

---

**Focus** 30–40 min

**Math Message**

*Math Masters, p. 71*

*Complete Math Masters, page 71.*

**Sharing Comparison Statements**

*Math Masters, p. 71*

**Math Message Follow-Up** Ask students to share their statements as you record them. If no one suggests them, be sure to make the following comparisons:

- The length of Maxine's ribbon is 2 times the length of Eve's ribbon.
- Maxine's ribbon is twice as long as Eve's.
- Two of Eve's ribbons would be equal to the length of Maxine's ribbon.
- Eve's ribbon is half the length of Maxine's because 8 is half of 16.

Explain that these statements are called *comparison statements.* They include information about both *quantities,* or amounts, being compared. Point out comparison words and ideas: *shorter than, longer than, two of this will equal that, two times as long as,* and so on. Help students recognize that the two quantities are in a relationship with each other—one quantity is a *number of times as long as* the other. The relationship involves multiplication, so these specific statements are called *multiplicative comparison statements.*

Display the following statement: *A DVD costs $15 and a book costs $5.* Ask students to make multiplicative comparison statements about the two objects. Expect statements like the following:

- The DVD costs 3 times as much as the book.
- Three books equal the cost of one DVD.
We can use equations to show the relationships between two quantities.

Ask: What equation can you write to describe the relationship between the DVD and the book? Sample answers: \(5 \times 3 = 15; 15 = 5 \times 3\)

Be sure to discuss how specific parts of each equation represent specific parts of the situation and model. 

**GMP.3** Ask: What does the 5 represent? The cost of the book.
What does the 3 represent? The number of times more the DVD costs than the book.
What does the 15 represent? The cost of the DVD. Conclude by emphasizing the multiplicative thinking behind the comparison situation. Ask: What is the mathematical relationship between the costs of the two items? The cost of the DVD is 3 times that of the book.

Direct students’ attention back to the Math Message. Ask: What equation can you write to describe the relationship between the two lengths? Sample answers: \(8 \times 2 = 16; 16 = 2 \times 8\)

### Representing Comparison Statements as Equations

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

Display the following problem: Scarlett has 7 crayons in her pencil box. Liam has 4 times as many crayons as Scarlett. How many crayons does Liam have? Allow time for students to solve on their slates.

Ask students what strategies they used to solve the problem. Share and discuss different approaches, including doubling and modeling with arrays. 7 doubled is 14; 14 doubled is 28.

Remind students that they have used multiplication to solve different types of problems: equal groups, arrays, and area models. Tell them that another type of multiplication problem focuses on comparing two quantities. It involves showing that one quantity is a specific number of times as many or as much as the other.

In the problem above, students compare the number of crayons in Liam’s box to the number of crayons in Scarlett’s box and use the idea of a number of times, or the multiplicative relationship, to solve it.

To emphasize the multiplicative relationship, ask:

- **Whose number of crayons is greater? Liam’s** How do you know? Sample answer: He has 4 times the number Scarlett has.
- **How many times as great?** 4
- **Will Liam have more or fewer than 7 crayons?** More Have students explain their thinking. Sample answer: The problem says Liam has 4 times as many as Scarlett. I know that times in this problem means multiplication, so he must have more.
Guide students to use equations to represent the comparison situation in the number story. Consider modeling using counters.

- What number is 4 times as many as 7? \(28\)
- What equation can we write to represent this situation? \(c = 4 \times 7\), or \(4 \times 7 = c\)

Display the equation \(3 \times 9 = 27\) and the problem below:

*Will has 9 CDs. Jeremy has 3 times as many CDs as Will. How many CDs does Jeremy have?*

Discuss the following:

- **Does the equation represent the situation in the number story?**
  Yes. How do you know? Sample answer: The equation tells us that 3 times as many as 9 is 27, which correctly matches the situation in the number story.

- **What is the comparison being made in this number story?** The number of CDs Jeremy has is being compared to the number of CDs Will has.

- **How do you know that one quantity in this equation is a number of times as many as another quantity in this equation?** Sample answers: The problem says that the number of CDs Jeremy has is 3 times as many as 9; 27 is 3 times as many as 9.

Now display the equation \(20 = 5 \times 4\). Have students determine how this equation can represent a comparison. Ask:

- **20 is 5 times as much as what number?** \(4\)
- **20 is 4 times as much as what number?** \(5\)

- **What comparison number story can you create to match this equation?** Sample answer: Jamal has 5 books on his shelf. His older brother Balta has 4 times as many books. How many books does Balta have?

Repeat this procedure as needed with other equations, prompting students to create and record comparison statements/situations for different multiplication equations. Remind them that each equation involves two quantities (one of the factors and the product) and another number (the other factor) that represents how many times as much or how many times as many.

**Creating and Interpreting Statements and Equations**

*Math Journal 1, p. 53*

Students work in pairs to complete journal page 53.
**Assessment Check-In**  
4.OA.1, 4.NBT.5  
*Math Journal 1, p. 53*

This lesson introduces students to multiplicative comparison situations involving verbal statements and equations. At this stage, expect students to solve Problems 1 and 2, which involve multiplication facts outside the context of number stories. As the language may be difficult for students, some may struggle with the story contexts in the other problems on the page. Help students who struggle break down each story into three numeric parts: the product, the factor, and the number representing “how many times as many.”

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

**Summarize** Have students share their comparison number stories from Problem 6 on journal page 53.

**Practice** 15–20 min

➤ **Playing Factor Captor**
*Student Reference Book, p. 258; Math Masters, pp. G15–G16*

Factor Captor is an effective way for students to practice finding factors. **GMP7.1, GMP7.2** See Lesson 2-3 for additional information.

**Differentiate**  
**Game Modifications**  
**Go Online**  
**Differentiation Support**

➤ **Math Boxes 2-8** 🎉  
*Math Journal 1, p. 54*

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

➤ **Home Link 2-8**
*Math Masters, p. 74*

Homework  Students create and interpret multiplicative comparison statements and equations. **GMP1.1, GMP2.1, GMP2.3**
# Unit 2 Progress Check

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

## Day 1: Unit Assessment

### Warm Up 5–10 min

**Self Assessment**
Students complete the Self Assessment.

### 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.

### Materials
Assessment Handbook, p. 12
Assessment Handbook, pp. 13–15
Assessment Handbook, p. 16

### Standards

<table>
<thead>
<tr>
<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>4.OA.2 Solve number stories involving multiplicative comparison.</td>
<td>2-6, 2-8, 2-9</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4.OA.4 Find all factor pairs for a whole number in the range 1–100.</td>
<td>2-3</td>
<td>2</td>
<td>1b</td>
<td></td>
</tr>
<tr>
<td>Determine whether a whole number is a multiple of a given 1-digit number.</td>
<td>2-4</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4.OA.5 Generate a number or shape pattern that follows a given rule.</td>
<td>2-13</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>4.NBT.4 Subtract multidigit whole numbers fluently using the standard algorithm.</td>
<td>2-7</td>
<td></td>
<td>1a, 1b</td>
<td></td>
</tr>
<tr>
<td>4.NBT.5 Multiply a whole number of up to four digits by a 1-digit number and a 2-digit number by a 2-digit number.</td>
<td>2-1 to 2-5, 2-7 to 2-9, 2-13</td>
<td>2, 3</td>
<td>1a, 2, 3a, 4a, 9</td>
<td>1a, 1b, 2a</td>
</tr>
<tr>
<td>Illustrate and explain multiplication strategies and calculations.</td>
<td>2-1, 2-7</td>
<td>1</td>
<td>1a, 4b</td>
<td></td>
</tr>
<tr>
<td>Multiply a whole number by a multiple of 10, 100, or 1000.</td>
<td>2-7</td>
<td>4</td>
<td>4a</td>
<td></td>
</tr>
<tr>
<td>4.MD.1 Know relative sizes of measurement units; express measurements in a larger unit in terms of a smaller unit.</td>
<td>2-7</td>
<td>4</td>
<td>4a, 4b</td>
<td></td>
</tr>
<tr>
<td>4.MD.2 Solve number stories involving whole numbers of measured quantities.</td>
<td>2-7</td>
<td></td>
<td>1a, 1b</td>
<td></td>
</tr>
<tr>
<td>4.MD.3 Apply area formulas for rectangles.</td>
<td>2-2</td>
<td>3</td>
<td>3a, 3b</td>
<td>2a, 2b</td>
</tr>
<tr>
<td>4.G.1 Draw, represent, and identify angles, including right, acute, and obtuse angles.</td>
<td>2-7, 2-10</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4.G.2 Classify 2-dimensional figures based on line segments or angles.</td>
<td>2-10, 2-11</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Identify line-symmetric figures and draw lines of symmetry.</td>
<td>2-12</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Goals for Mathematical Process and Practice (GMP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMP1 Make sense of your problem. <a href="#">GMP1</a></td>
<td>2-6, 2-8</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMP6 Explain your mathematical thinking clearly and precisely. <a href="#">GMP6</a></td>
<td>6</td>
<td>3b, 4b</td>
<td>2b</td>
<td></td>
</tr>
</tbody>
</table>

*Go Online* to see how mastery develops for all standards within the grade.
1 Warm Up 5–10 min

Self Assessment
Assessment Handbook, p. 12

WHOLE CLASS SMALL GROUP PARTNER INDEPENDENT

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

2a Assess 35–50 min

Unit 2 Assessment
Assessment Handbook, pp. 13–15

WHOLE CLASS SMALL GROUP PARTNER INDEPENDENT

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

Generic rubrics in the Assessment Handbook appendix can be used to evaluate students’ progress on the Mathematical Process and Practice Standards.
Adjusting the Assessment

<table>
<thead>
<tr>
<th>Item(s)</th>
<th>Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To scaffold Item 1, have students use cubes to build the arrays.</td>
</tr>
<tr>
<td>2</td>
<td>To scaffold Item 2, have students use a Multiplication/Division Facts Table to identify the multiples.</td>
</tr>
<tr>
<td>3</td>
<td>To extend Item 3, have students find the perimeter of the rectangle.</td>
</tr>
<tr>
<td>4</td>
<td>To scaffold Item 4, have students use a clock to count the number of minutes.</td>
</tr>
<tr>
<td>5</td>
<td>To extend Item 5, have students record an equation with an unknown to represent the problem.</td>
</tr>
<tr>
<td>6</td>
<td>To scaffold Item 6, have students tear off a square corner from a piece of paper to help them identify the right angle in the right triangle.</td>
</tr>
<tr>
<td>7</td>
<td>To scaffold Item 7, have students refer to the poster of geometry terms to help them determine the properties.</td>
</tr>
<tr>
<td>8</td>
<td>To extend Item 8, have students draw all lines of symmetry.</td>
</tr>
<tr>
<td>9</td>
<td>To extend Item 9, have students create their own “What’s My Rule?” table.</td>
</tr>
</tbody>
</table>

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 114–115 or the online Spiral Tracker for details on Unit 2 focus topics and the spiral.

Unit 2 Challenge (Optional)

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

<table>
<thead>
<tr>
<th>Standards</th>
<th>Goals for Mathematical Content (GMC)</th>
<th>Cumulative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.OA.3</td>
<td>Solve multistep number stories involving the four operations, interpreting any remainders.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Model number stories with equations, using a letter for the unknown.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Assess the reasonableness of answers to number stories and other problems.</td>
<td>9</td>
</tr>
<tr>
<td>4.NBT.1</td>
<td>Recognize the relationship between the places in whole numbers.</td>
<td>2b</td>
</tr>
<tr>
<td>4.NBT.2</td>
<td>Read, write, and identify places in numbers.</td>
<td>1a–1f, 2a</td>
</tr>
<tr>
<td></td>
<td>Compare and order multidigit whole numbers.</td>
<td>3a, 3b</td>
</tr>
<tr>
<td></td>
<td>Record multidigit whole-number comparisons using &gt;, =, or &lt;.</td>
<td>3a, 3b</td>
</tr>
<tr>
<td>4.NBT.3</td>
<td>Use place-value understanding to round whole numbers to any place.</td>
<td>4a, 4b</td>
</tr>
<tr>
<td>4.NBT.4</td>
<td>Add multidigit whole numbers fluently using the standard algorithm.</td>
<td>5a, 5b, 9</td>
</tr>
<tr>
<td></td>
<td>Subtract multidigit whole numbers fluently using the standard algorithm.</td>
<td>6a, 6b, 9</td>
</tr>
<tr>
<td>4.NBT.5</td>
<td>Multiply a whole number of up to four digits by a 1-digit number and a 2-digit number by a 2-digit number.</td>
<td>7a, 8</td>
</tr>
<tr>
<td>4.MD.1</td>
<td>Know relative sizes of measurement units; express measurements in a larger unit in terms of a smaller unit.</td>
<td>8</td>
</tr>
<tr>
<td>4.MD.2</td>
<td>Solve number stories involving whole numbers of measured quantities.</td>
<td>8</td>
</tr>
<tr>
<td>4.MD.3</td>
<td>Apply perimeter formulas for rectangles.</td>
<td>7a, 7b</td>
</tr>
</tbody>
</table>

Goals for Mathematical Process and Practice (GMP)

| SMP6 | Explain your mathematical thinking clearly and precisely. | 4b, 7b, 8, 9 |
| SMP7 | Use structures to solve problems and answer questions. | 4b |

Look Ahead  10–15 min

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

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

Math Journal 1, p. 67; fraction circles
Math Masters, pp. 91–96

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

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Lesson 2-14  205
Lesson 2-14
Unit 2 Cumulative Assessment (continued)

1. In the number 967,481...
   a. the digit 4 is in the hundreds place.
   b. the digit 1 is in the ones place.
   c. the digit 9 is in the hundred-thousands place.
   d. the digit 7 is in the thousands place.
   e. the digit 8 is in the tens place.
   f. What is the value of the digit 6? 60,000

2. a. Write a number that has...
   • 9 in the hundreds place
   • 2 in the ten-thousands place
   • 9 in the ones place
   • 8 in the thousands place
   • 0 in the tens place
   • 4 in the hundred-thousands place
   4,289,090
   b. How many times as large is the 9 in the hundreds place as the 9 in the ones place?
   100 times as large

3. Write <, >, or =.
   a. 555,644 < 556,604
   b. 980,008 > 908,080

4. Use U.S. traditional addition.
   a. 364 + 278 = 642
   b. 494 + 1,150 = 1,644

5. Use U.S. traditional subtraction.
   a. 729 - 463 = 266
   b. 636 - 204 = 432
Lesson 2-14

Math Boxes 2-14: Preview for Unit 3

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

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

Fractions and Decimals

Exponents and roots are used in the biggest ideas in mathematics: Much of arithmetic, for example, is just finding averages and comparing fractions. When we talk about "1/2" or "1/4", we are representing a fractional part of a whole.

Students use a multiplication to find the answer, then find the answer, division to find the answer, subtraction to find the answer, and to find the answer, subtraction to find the answer. The answer is the result of dividing the total into the parts.

Comparing Fractions

When students compare fractions with the same denominator or numerator they can determine which is greater by looking at the pattern that they noticed and extend it. In the first grade students learned that a two digit number is the one that is the most important in a fraction. In the second grade students learned that a two digit number is the one that is the most important in a fraction. In the third grade students learned that a two digit number is the one that is the most important in a fraction.

Mixed Practice

Home Connection

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

Math Journal 1, p. 67

Math Masters, pp. 91-96

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