Standards Resource Guide

Grade 3

Overview

This guide is designed to support educators in interpreting and implementing the 2025 Louisiana Student Standards for Mathematics (LSSM). It provides descriptions of each standard to clarify its meaning and application to student learning. The document outlines the intended level of rigor and includes coherence to prerequisite and corequisite standards. Examples are provided for illustrative purposes only and do not represent a comprehensive list.

Additional information on the 2025 Louisiana Student Standards for Mathematics, including guidance on reading standards codes, a listing of standards for each grade or course, and links to additional resources, is available on the Louisiana Math Page. Questions may be directed to Math@la.gov.

August 2026

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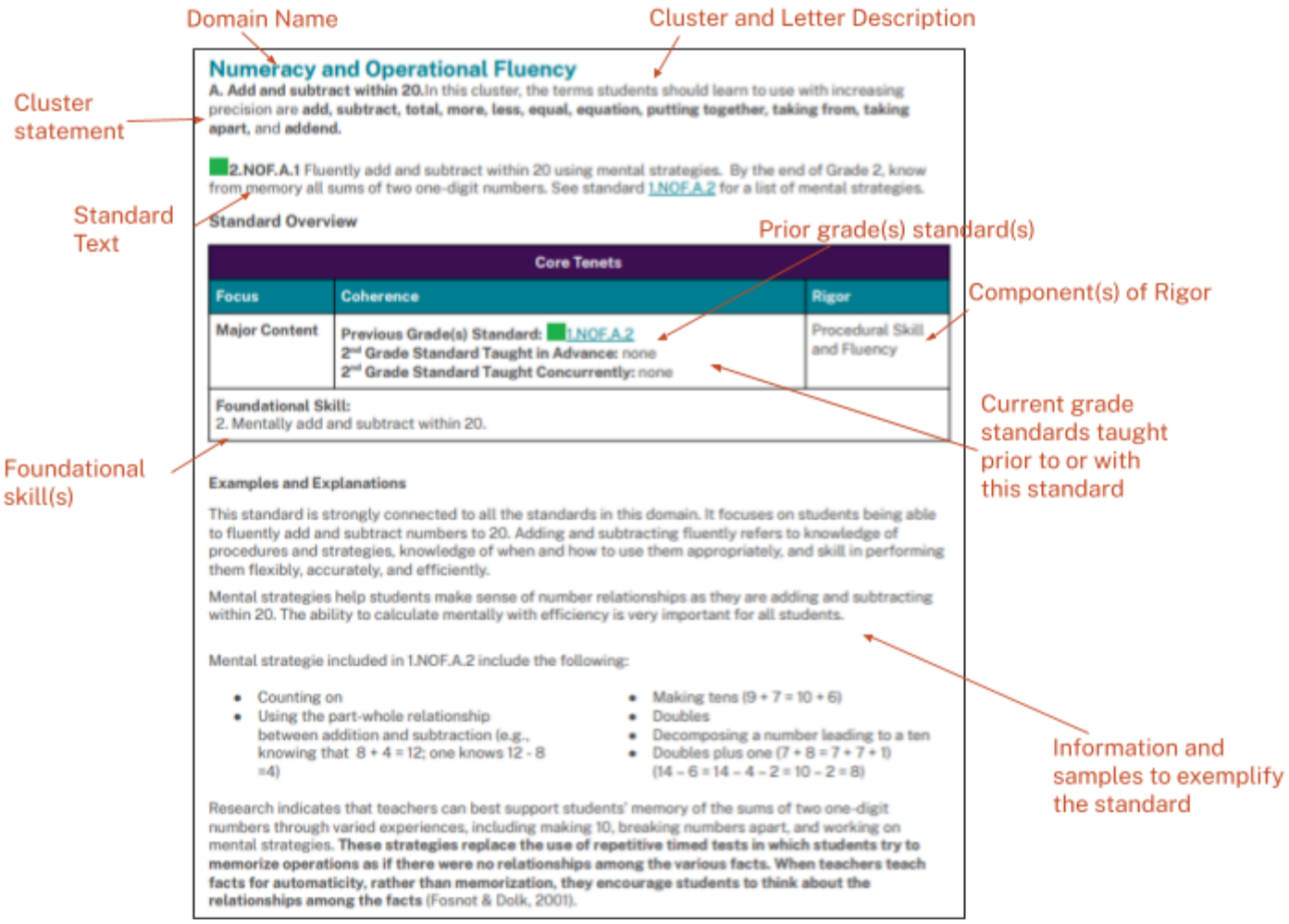
Introduction

How to Read This Guide

The diagram below provides an overview of the information found in all standards resource guides. Definitions and more complete descriptions are provided on the next page.



*Grades 3 through Geometry will also include a section with connections to assessment item types and achievement level descriptors.

Standards Codes: Major Work, Supporting Work, Additional Work

1. **Domain Name and Abbreviation:** A grouping of standards consisting of related content that is further divided into clusters. Each domain has a unique abbreviation, which is provided in parentheses beside the domain name.
2. **Cluster Letter and Description:** Each cluster within a domain begins with a letter. The description provides a general overview of the focus of the standards in the cluster.

3. **Previous Grade(s) Standards:** One or more standards that students should have mastered in previous grades to prepare them for new learning related to the current grade-level standard. For students who have unfinished learning, teachers should build in proactive, just-in-time supports to build essential prerequisite knowledge.
4. **Standards Taught in Advance:** These grade-level standards demonstrate within-grade coherence and include concepts on which the target standard is built. Students should have exposure to these standards before instruction in the target standard. As with previous-grade standards, teachers should plan proactive, just-in-time supports to build within-grade prerequisite knowledge ahead of instruction on the target standard.
5. **Standards Taught Concurrently:** These grade-level standards demonstrate within-grade coherence and include standards that should be taught at the same time as the target standard to provide coherence and connectedness in instruction.
6. **Component(s) of Rigor:** See full explanation on components of rigor below.
7. **Sample Problem:** The sample problem provides an example of how a student might meet the requirements of the standard. Multiple examples are provided for some standards. However, sample problems should not be considered an exhaustive list. Explanations, when appropriate, are also included.
8. **Text of Standard:** The complete text of the targeted Louisiana Student Standards of Mathematics is provided.

Classification of Major, Supporting, and Additional Work

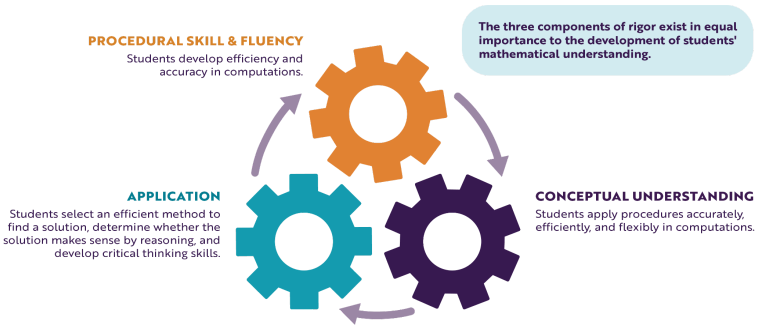
Students should spend the majority of their time on the major work of the grade, supporting work, and, where appropriate, additional work engages students in the major work of the grade, often through a change of the **context** within which students are performing mathematics. Each standard is color-coded to quickly and simply determine the focus for the grade. Furthermore, standards from previous grades that provide foundational skills for current grade standards are also color-coded to show whether those standards are classified as major, supporting, or additional in respective grades.

Core Tenets

The 2016 Louisiana Student Standards for Math called for three instructional shifts. Since then, teachers have used these shifts to ensure deep understanding and consistent application in mathematics classrooms across the state. Now, these shifts are recognized as core tenets that serve as the foundation and guiding principles of Louisiana's mathematics standards.

Coherence in mathematics refers to a coherent body of knowledge composed of interconnected concepts, principles, and procedures. These concepts are logically linked, building upon one another, and work together to deepen understanding, support problem solving, and enable learners to apply mathematical ideas consistently and meaningfully across different contexts.

Rigor in mathematics instruction does not simply mean increasing the difficulty or complexity of practice problems. Incorporating rigor into classroom instruction and student learning requires students to engage deeply with standards and grapple meaningfully with the concepts and ideas embedded



with them. The **three** components of rigor, listed below, exist in equal importance to the development of students' mathematical understanding.

- **Conceptual understanding** refers to understanding mathematical concepts, operations, and relations. It is more than knowing isolated facts and methods. Students should be able to make sense of why a mathematical idea is important and the kinds of contexts in which it is useful. It also allows students to connect prior knowledge to new ideas and concepts.
- **Procedural skill and fluency** is the ability to apply procedures accurately, efficiently, and flexibly. It requires speed and accuracy in calculation while giving students opportunities to practice basic skills without dictating the strategy or method chosen. Students' ability to solve more complex application tasks is dependent on procedural skill and fluency.
- **Application** provides valuable context for learning and the opportunity to solve problems in a relevant and meaningful way. It is through real-world application that students learn to select an efficient method to find a solution, determine whether the solution makes sense by reasoning, and develop critical thinking skills.

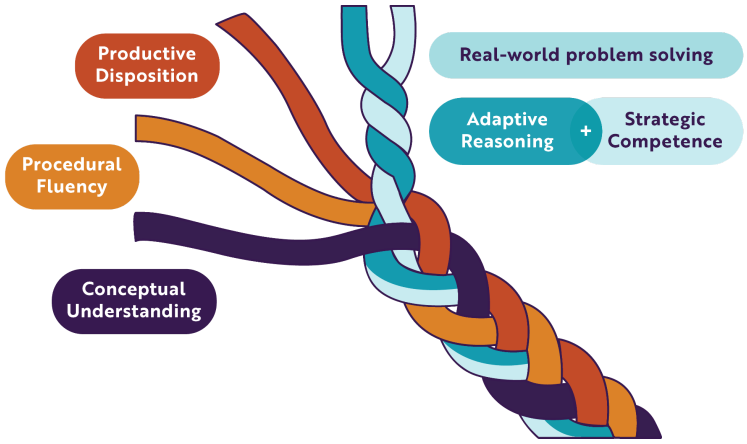
Focus calls for intentional emphasis on specific topics, skills, and ideas within grade-level mathematics instruction. Not all content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or the importance to future mathematics or the demands of college and career readiness. More time in these areas is also necessary for students to meet the Louisiana Standards for Mathematical Practice. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Students should spend the majority of time on the major () work of the grade, supporting () work, and, where appropriate, additional ( ) work can engage students in the major work of the grade.

The Strands for Mathematical Proficiency

The strands of mathematical proficiency, as defined by the National Research Council (NRC),[1] provide a framework describing what proficiency means for a learner in mathematics.

The strands of mathematical proficiency are intertwined, gradually developed, and deepened over time. When intentionally presented in a connected and balanced way, each strand supports the others, ultimately strengthening the proficiency of learners.

1. **Conceptual Understanding** - Students develop an understanding of key mathematical ideas and relationships and explain why procedures work.



2. **Procedural Fluency** - Students use mathematical procedures with skill and flexibility, guided by a strong grasp of underlying concepts.
3. **Productive Dispositions** - Students view mathematics as coherent, valuable, and meaningful
4. **Real World and Problem Solving** - A combination of both adaptive reasoning and strategic competence, students represent and solve real-world mathematical problems logically, justify solutions, and clearly explain and defend reasoning.

The Relationship Between Mathematical Proficiency and the Components of Rigor

While there is some overlap between the Strands of Mathematical proficiency and the Core Tenets, there is a distinct difference between the two. The strands are a framework that is focused on learner outcomes and what it means for a student to be proficient in mathematics. The Core Tenets provide a framework for how teachers should design instruction to support learning. The core tenets reflect what should be done instructionally, while the proficiency strands represent the outcome, or what students become, as a result of that instruction.

Mathematical Fluency

Fluency in mathematics is the ability to apply foundational skills and concepts flexibly, accurately, and efficiently, grounded in strong conceptual understanding to solve problems, make connections, and reason mathematically across various contexts. While fluency is an essential component of mathematics instruction, it does not represent the full depth of a mathematical standard; it must be developed alongside conceptual understanding, reasoning, and problem-solving to ensure deep and meaningful learning.

Concrete - Representational - Abstract Framework

The Concrete-Representational-Abstract (CRA) Framework describes the instructional processes that students experience to build conceptual understanding of mathematics. The first stage is where students build a concrete understanding of a concept through the use of manipulatives or other physical objects.

[1] ADDING + IT UP HELPING CHILDREN LEARN MATHEMATICS National Academies of Sciences, Engineering, and Medicine. 2001. Adding It Up: Helping Children Learn Mathematics. Washington, DC: The National Academies Press. https://doi.org/10.17226/5109.

During the second phase, learners move into visual representations of concepts. Finally, during the abstract phase, students apply their understanding of the concepts abstractly through the use of numbers and symbols. When students engage in learning that follows this process, it allows them to build a solid understanding of key mathematical concepts and ideas, ensuring comprehension that is transferable and flexibly applied across grade bands.

An example of how this framework is represented across the progression of the Louisiana Student Standards for Mathematics can be seen in the way student learning progresses across a concept, such as linear functions. In fourth grade (4.AR.A.1), students are introduced to multiplicative comparison, where much of the learning is very **concrete**. At this phase, students are using counters and other manipulatives to physically compare quantities to determine the meaning of "times as many." When they move into the middle grades, this becomes more representational as students apply their concrete understanding to recognize and represent proportional relationships. These are represented in various ways, such as ratio tables, double number lines, and graphs (6.PF.A.2, 7.PF.A.2). When students enter high school, the learning becomes **abstract** as they interpret linear functions such as y=kx and come to understand slope as rate of change.

While the example above represents a linear version of this instructional process across multiple grades, it is important to note that the concrete and representational components can occur at different times throughout the progression of learning, and may occur simultaneously across various periods. Additionally, this instructional process may also occur within lessons, units, or within the grade level.

Note about tasks vs. word problems: Real-world math tasks are open-ended and involve reasoning, exploration, and multiple solution paths. Word problems, by contrast, are usually structured scenarios with all needed information and a single correct answer. Real-world tasks build critical thinking and decision-making, while word problems focus on translating language into mathematical operations. Both types of tasks play an important role in mathematics learning — neither is inherently better than the other. Students should have frequent opportunities to engage with both, as each develops different but complementary aspects of mathematical proficiency. See the example below.

Word Problem (3.AR.A.3)	**Real-World Mathematical Task** (3.AR.A.3)
Max the monkey loves bananas. Molly, his trainer, has 24 bananas. If she gives Max 4 bananas each day, how many days will the bananas last?	Max the monkey loves bananas. Molly, his trainer, has 24 bananas. She plans to give Max the same number of bananas each day. What are some different ways she can use all 24 bananas? How many days will they last?

Standards for Mathematical Practice

The Louisiana Standards for Mathematical Practice are expected to be integrated into every mathematics lesson for all students in grades K-12. Below are a few examples of how these practices may be integrated into tasks that students in grade 3 complete.

Louisiana Standards for Mathematical Practice (MP)	
Louisiana Standard	**Explanations and Examples**
3.MP.1 Make sense of problems and persevere in solving them.	In third grade, students know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Third graders may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, "Does this make sense?" They listen to the strategies of others and will try different approaches. They often will use another method to check their answers.
3.MP.2 Reason abstractly and quantitatively.	Third graders should recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities.
3.MP.3 Construct viable arguments and critique the reasoning of others.	In third grade, students may construct arguments using concrete referents, such as objects, pictures, and drawings. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?" They explain their thinking and respond to others' thinking.
3.MP.4 Model with mathematics.	Students experiment with representing problem situations in multiple ways, including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Third graders should evaluate their results in the context of the situation and reflect on whether the results make sense.
3.MP.5 Use appropriate tools strategically.	Third graders consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper to find all the possible rectangles that have a given perimeter. They compile the possibilities into an organized list or a table and determine whether they have all the possible rectangles.
3.MP.6 Attend to precision.	As third graders develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the area of a rectangle, they record their answers in square units.
3.MP.7 Look for and make use of structure.	In third grade, students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).
3.MP.8 Look for and express regularity in repeated reasoning.	Students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property as a strategy for using products they know to solve products that they don't know. For example, if students are asked to find the product of 7 x 8, they might decompose 7 into 5 and 2 and then multiply 5 x 8 and 2 x 8 to arrive at 40 + 16 or 56. In addition, third graders continually evaluate their work by asking themselves, "Does this make sense?"

Grade Level Expected Foundational Skills

By the end of grade 3, mathematically proficient students can reliably apply the following skills to engage in grade-appropriate mathematical tasks. This list does not represent the full depth of learning expected in grade 3, but consists of the foundational skills required by the standards.

1. Know all products of two one-digit numbers from memory.
2. Know all quotients of numbers within 100 by memory.
3. Fluently add and subtract within 1,000.
4. Compare numbers up to 100,000, identifying which are greater than, less than, or equal to each other.
5. Estimate and round whole numbers to the nearest 10 and 100.
6. Identify equivalent fractions with denominators limited to 2, 3, 4, 6, and 8.

Numeracy and Operational Fluency

A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. In this cluster, the terms students should learn to use with increasing precision are **product, groups of, quotient, partitioned equally, multiplication, division, equal groups, group size, array, equation, unknown, and expression.**

3.NOF.A.1 Understand and interpret a fraction with denominators 2, 3, 4, 6, and 8.

a. Understand a unit fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole or a set is partitioned into *b* equal parts, where *b* is a non-zero whole number.
b. Understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$.
c. Represent fractions greater than zero and less than or equal to one using concrete objects, number lines, or pictorial models.
d. Read and write fractions in standard form and written unit form.
e. Solve real-world mathematical tasks involving partitioning an object or set of objects, identifying a fraction as parts of a whole.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.DM.A.2, 2.GL.A.3 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.NOF.A.2, 3.DM.A.1	Conceptual Understanding

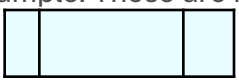
Examples and Explanations

Students extend the concepts learned in 1.GL.A.3 and 2.GL.A.3. Some important concepts related to developing understanding of fractions from grades 1 and 2, and their extensions include:

- Understand that fractional parts must be equal-sized.

Example: These are thirds.

Non-example: These are not thirds.



- Lauryn has a cookie cake for her birthday. She and her 7 friends get an equal sized piece of the cookie cake. What fraction of the cake does each person get?
    - Student Response: Each person will receive $\frac{1}{8}$ of the cookie cake.

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.I.3.1, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Fractions as Numbers 3.NOF.A.1 3.NOF.A.2 LEAP.I.3.1	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2, 3, 4, 6, and 8.	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2, 4, and **8.**	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2 and 4.	
	Represents 1/b on a number line diagram by partitioning the number line between 0-1 into b equal parts and recognizing that b is the total number of parts.	Represents 1/b on a number line diagram **by partitioning** the number line between 0-1 into b equal parts and recognizing that b is the total number of parts.	**Represents** 1/b on a number line diagram when partitioned between 0 and 1 into b equal parts and **recognizing that b is the total number of parts.**	Identifies 1/b on a number line diagram when partitioned between 0 and 1 into b equal parts.
	Demonstrates the understanding of the quantity a/b by marking off a parts of 1/b from 0 on the number line.	**Demonstrates the understanding of the quantity a/b by marking off a parts of 1/b from 0 on the number line.**	Represents fractions in the form a/b using a visual model.	
	Applies the concepts of 1/b and a/b in real-world situations.			
	Describes a number line that best fits a context.			

3.NOF.A.2 Understand a fraction with denominators 2, 3, 4, 6, and 8 as a number on a number line diagram.

a. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part, based at 0, locates the number $\frac{1}{b}$ on the number line.

b. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off *a* lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.

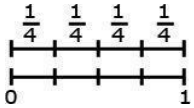
Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.DM.B.6 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.NOF.A.1; 3.DM.B.3	Conceptual Understanding (2, 2a, 2b)

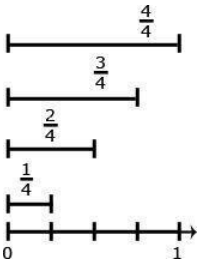
Examples and Explanations

Students transfer their understanding of parts of a whole to partition a number line into equal parts. There are two new concepts addressed in this standard that students should have time to develop.

1. On a number line from 0 to 1, students can partition (divide) it into equal parts and recognize that each segmented part represents the same length.



2. Students label each fractional part based on how far it is from zero to the endpoint.

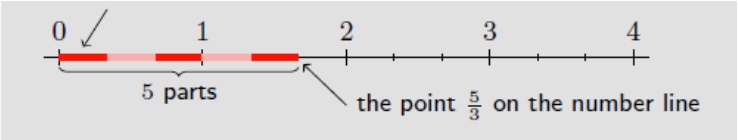


Example:

- Draw a number line representation of 5/3.

  The distance between 0 and 1 is divided into 3 parts of equal length.

  The location of 5/3 is determined by starting at zero-thirds and counting five one-third parts of equal length.



Part b focuses on helping students understand fractions as iterations of a unit fraction on a number line. Students count forward in equal parts (such as thirds), starting at zero, to determine the location of fractions, like 5/3.

At this stage, students are not expected to work with equivalent fractions. The emphasis should be on building a strong understanding of fractional units, which will support later work with equivalent fractions.

Additionally, at this stage, students are not required to convert fractions greater than one whole to mixed numbers.

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.I.3.I, LEAP.II.3.8, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Fractions as Numbers 3.NOF.A.1 3.NOF.A.2 LEAP.I.3.1	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2, 3, 4, 6, and 8.	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2, 4, and **8.**	Understands 1/b is equal to one whole that is partitioned into b equal parts with denominators of 2 and 4.	
	Represents 1/b on a number line diagram by partitioning the number line between 0-1 into b equal parts and recognizing that b is the total number of parts.	Represents 1/b on a number line diagram **by partitioning** the number line between 0-1 into b equal parts and recognizing that b is the total number of parts.	**Represents** 1/b on a number line diagram when partitioned between 0 and 1 into b equal parts and **recognizing that b is the total number of parts.**	Identifies 1/b on a number line diagram when partitioned between 0 and 1 into b equal parts.
	Demonstrates the understanding of the quantity a/b by marking off a parts of 1/b from 0 on the number line.es	**Demonstrates the understanding of the quantity a/b by marking off a parts of 1/b from 0 on the number line.**	Represents fractions in the form a/b using a visual model.	
	Applies the concepts of 1/b and a/b in real-world situations.			
	Describes a number line that best fits a context.			

3.NOF.A.3 Explain equivalence of fractions with denominators 2, 3, 4, 6, and 8 as fractions that have different numerators and denominators but are equal to the same value, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line.
b. Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent, e.g., by using a visual fraction model or number line.
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model or number line.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.NOF.A.1, 3.NOF.A.2 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding (3, 3a,3b,3c,3d)
Foundational Skills: 6. Identify equivalent fractions with limited denominators.		

Examples and Explanations

An important concept when comparing fractions is to look at the size of the parts and the number of the parts.

Examples:

- For example, $\frac{1}{8}$ is smaller than $\frac{1}{2}$ because when 1 whole is cut into 8 pieces, the pieces are much smaller than when the same whole is cut into 2 pieces.

  Students recognize that when examining fractions with common denominators, the wholes have been divided into the same number of equal parts. So the fraction with the greater numerator has the greater number of equal parts.

  $\frac{2}{6} < \frac{5}{6}$

- As in all comparisons of fractions, students must understand that comparisons are valid only if the wholes are identical. This is a critical understanding when comparing fractions that have the same numerator but different denominators, as indicated in part d. For example, $\frac{1}{2}$ of a large pizza is a different amount than $\frac{1}{2}$ of a small pizza. The goal is to have students see that, for unit fractions, the fraction with the greater denominator is smaller, by reasoning, for example, that in order for more (identical) pieces to make the same whole, the pieces must be smaller. Additionally, students must recognize that each fraction has the same number of equal parts, but the size of the parts is different for each fraction. They can infer that the same number of smaller pieces is less than the same number of bigger pieces. After having ample opportunities to use number lines, students should make such comparisons without the visual support.

  $\frac{3}{8} < \frac{3}{4}$

All parts of this standard call for students to use visual fraction models (area models) or number lines to explore the idea of equivalent fractions. Students should only explore equivalent fractions using models, rather than using algorithms or procedures.

Part c includes writing whole numbers as fractions. This standard is the building block for fifth grade, where students divide a set of objects into a specific number of groups. Students must understand the meaning of $\frac{a}{1}$.

Example 2 above addresses part d.

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.I.3.I, LEAP.II.3.3, LEAP.II.3.5, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Fraction Equivalence 3.NOF.A.3 LEAP.I.3.1	Understands, recognizes, and generates equivalent fractions with denominators of 2, **3**, 4, **6,** and 8.	Understands, recognizes, and generates equivalent fractions using denominators of 2, 4, and 8.	Given a visual model, **understands,** recognizes, and **generates** equivalent fractions with denominators of 2, 4, and 8.	Given a visual model, recognizes equivalent fractions with denominators of 2, 4, and 8.
	Expresses whole numbers as fractions **and recognize fractions that are equivalent to whole numbers.**	Expresses whole numbers as fractions.	Expresses **whole numbers** as fractions.	Expresses the number 1 as a fraction.
	Compares two fractions with the same numerator or same denominator using symbols to justify conclusions, **plots the location of equivalent fractions on a number line,** and recognizes two fractions must refer to the same whole in order to be compared.	Compares two fractions with the same numerator or same denominator using symbols**, justifies conclusions with a visual model**, and recognizes two fractions must refer to the same whole in order to be compared.	**Compares two fractions with the same numerator or same denominator using symbols and recognizes two fractions must refer to the same whole in order to be compared.**	
	Given a whole number and two fractions in a real-world			

	situation, plots all three numbers on a number line and determines which fraction is closest to the whole number. Justifies the comparison by plotting points on a number line.			

B. Multiply and divide within 100. In this cluster, the terms students should learn to use with increasing precision are **operation, multiply, divide, factor, product, quotient, unknown, reasonableness, mental computation,** and **property**.

3.NOF.B.4 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know all products of two one-digit numbers from memory.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.AR.B.5, 3.AR.B.6 **3rd Grade Standard Taught Concurrently:** 3.AR.A.4, 3.AR.C.7	Procedural Skill and Fluency
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory.		

Examples and Explanations

This standard uses the word fluently, which means with accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using strategies such as the distributive property). "Know from memory" should **not** focus only on timed tests and repetitive practice. Students must have numerous experiences working with manipulatives, pictures, arrays, real-world problems, and numbers to internalize the basic multiplication facts. **Within 100 has been defined to include the facts in the multiplication table from 0 × 0 through 10 × 10. Facts from 0 × 0 to 9 × 9 should be known from memory at the end of the year.**

Strategies students may use to attain fluency include:

- Multiplication by zeros and ones
- Doubles (2s facts), Doubling twice (4s), Doubling three times (8s)
- Tens facts (relating to place value, 5 × 10 is 5 tens or 50)
- Five facts (half of tens)
- Skip counting (counting groups of __ and knowing how many groups have been counted)
- Nines (10 groups less one group, e.g., 9 × 3 is ten groups of 3 minus one group of 3)
- Decomposing into known facts (6 × 7 is 6 × 6 plus one more group of 6)
- Turn-around facts (commutative property)
- Fact families (Ex: 6 × 4 = 24; 24 ÷ 6 = 4; 24 ÷ 4 = 6; 4 × 6 = 24)
- Missing factors

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Products and Quotients 3.AR.A.1 3.AR.A.2 3.AR.A.4 3.AR.B.6 3.NOF.B.4	**Understands and** interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.
	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **both factors greater than 5 and less than or equal 10.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **one factor greater than or equal to 5.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.
	Represents a multiplication or division context as an equation.			
	Fluently multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	**Fluently** multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.

C. Use place value understanding and properties of operations to perform multi-digit arithmetic. In this cluster, the terms students should learn to use with increasing precision are operation, multiply, divide, factor, product, quotient, unknown, reasonableness, mental computation, and property.

3.NOF.C.5 Use place value understanding to:

a. Round whole numbers to the nearest 10 or 100.
b. Use estimation to reason about solutions to real-world mathematical tasks.

Standard Overview

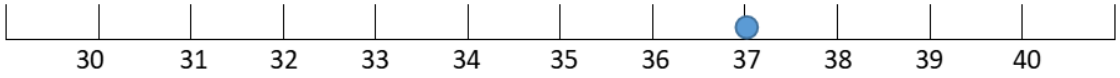
Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** 2.NOF.B.2 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 5. Estimate and round whole numbers to the nearest 10 and 100.		

Examples and Explanations

This standard refers to place value understanding, which extends beyond an algorithm or memorized procedure for rounding. The expectation is that students have a deep understanding of place value and number sense and can explain and reason about the answers they get when they round. Students should have numerous experiences using a number line and a hundreds chart as tools to support their work with rounding.
The number line is a tool that can be used to support students' development related to rounding numbers. For example, round 37 to the nearest ten.

Example:

Teacher: Between which two tens does the number 37 fall?
Student: 37 falls between 30 and 40.
Teacher: Let's make a number line.
Teacher: Where would 37 be on the number line?
Students mark 37.
Teacher: Is 37 closer to 30 or 40?
Student: 40



Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): LEAP.I.3.2

3.NOF.C.6 Fluently add and subtract up to 1000 using strategies and algorithms based on place value understanding, properties of operations, and/or the part-whole relationship between addition and subtraction.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** 2.AR.A.2; 2.NOF.C.8 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** none	Procedural Skill and Fluency
Foundational Skills: 3. Fluently add and subtract within 1,000.		

Examples and Explanations

This standard refers to fluency, which means accuracy, efficiency (using a reasonable amount of steps and time), and flexibility (using strategies such as the distributive property). The word algorithm refers to a procedure or a series of steps. There are algorithms other than the standard algorithm, such as partial sums (e.g., the arrow) or partial differences. Third-grade students should have experiences beyond the standard algorithm.

Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Students explain their thinking and show their work by using strategies and algorithms, and verify that their answer is reasonable.

Addition Example:

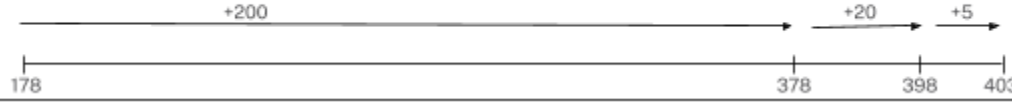
- Show how to add 178 and 225.

Student 1
100 + 200 = 300
70 + 20 = 90
8 + 5 = 13
300 + 90 + 13 = 403

Student 2
I added 2 to 178 to get 180. I added 220 to get 200. I added the 3 left over to get 403.

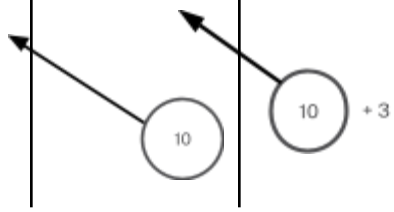
Student 3
I know that 75 plus 25 equals 100. I then added 1 hundred from 178 and 2 hundreds from 225. I had a total of 4 hundreds and I had 3 more left to add. So I have 4 hundreds plus 3 more which is 403.

Student 4
178 + 200 = 378
378 + 20 = 398
398 + 5 = 403



Teachers can use a place value chart to build students' concrete understanding before moving to the standard algorithm.

Thousands	Hundreds	Tens	Ones
	1 2	7 2	8 5
	3 +1	9 + 1	13
	4	0	3



178 + 225 = 403

Subtraction Example:

- Show how to subtract 573 and 399.

  Students could use several approaches to solve the problem, including the standard algorithm. Examples of other methods students could use are listed below:
  - Adding up strategy: 399 + 1 = 400, 400 + 100 = 500, 500 + 73 = 573, therefore 1 + 100 + 73 = 174
  - Compensation Strategy: 400 + 100 is 500; 500 + 73 is 573; 100 + 73 is 173 plus 1 (for 399 to 400) is 174
  - Subtracting to count down strategy: Take away 73 from 573 to get to 500, take away 100 to get to 400, and take away 1 to get to 399. Then 73 +100 + 1 = 174
  - Adding by tens or hundreds strategy: 399 + 1 is 400, 500 (that's 100 more). 510, 520, 530, 540, 550, 560, 570, (that's 70 more), 571, 572, 573 (that's 3 more) so the total is 1 + 100 + 70 + 3 = 174

Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): LEAP.I.3.2, LEAP.I.3.3, LEAP.I.3.4, LEAP.I.3.5, LEAP.I.3.6

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Multi-Digit Arithmetic 3.NOF.C.6 3.NOF.C.7	Fluently adds and subtracts within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	**Fluently** adds and subtracts within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Adds and subtracts within 1000, using strategies and algorithms based on place value, properties of operations with scaffolding, and/or the relationship between addition and subtraction.	Adds and subtracts within 1000, using strategies and algorithms based on place value, properties of operations with scaffolding, and/or the relationship between addition and subtraction.
	Multiplies one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.	Uses repeated addition to multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.	**Uses repeated addition to multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.**	

3.NOF.C.7 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value understanding and properties of operations.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.NOF.B.2 **3rd Grade Standard Taught in Advance:** 3.AR.B.5 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 1. Know all products of two one-digit numbers from memory.		

Examples and Explanations

Students use base-ten blocks, diagrams, or hundreds charts to multiply one-digit numbers by multiples of 10 from 10-90. They apply their understanding of multiplication and the meaning of the multiples of 10. The special role of 10 in the base-ten system is important in understanding multiplication of one-digit numbers with multiples of 10. For example, the product 3 × 50 can be represented as 3 groups of 5 tens, which is 15 tens, which is 150. This reasoning relies on the associative property of multiplication:
3 × 50 = 3 × (5 × 10) = (3 × 5) × 10 = 15 × 10 = 150.

Example:

- For the problem 4 × 50, students should think of this as 4 groups of 5 tens or 20 tens. Twenty tens equals 200.

Students may use manipulatives or drawings to demonstrate their understanding.

Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): LEAP.I.3.2, LEAP.I.3.3, LEAP.I.3.4, LEAP.I.3.5, LEAP.I.3.6

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Multi-Digit Arithmetic 3.NOF.C.6 3.NOF.C.7	Fluently adds and subtracts within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	**Fluently** adds and subtracts within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Adds and subtracts within 1000, using strategies and algorithms based on place value, properties of operations with scaffolding, and/or the relationship between addition and subtraction.	Adds and subtracts within 1000, using strategies and algorithms based on place value, properties of operations with scaffolding, and/or the relationship between addition and subtraction.
	Multiplies one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.	Uses repeated addition to multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.	**Uses repeated addition to multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.**	

Algebraic Reasoning

A. Represent and solve problems involving multiplication and division. In this cluster, the terms students should learn to use with increasing precision are product, groups of, quotient, partitioned equally, multiplication, division, equal groups, group size, array, equation, unknown, and expression.

3.AR.A.1 Interpret products of whole numbers and interpret whole number factors.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.AR.B.3; 2.AR.B.4 **3rd Grade Standard Taught in Advance:** 3.AR.B.6 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 1. Know all products of two one-digit numbers from memory.		

Examples and Explanations

This standard requires that students interpret products of whole numbers and/or factors. Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. Multiplication requires students to think in terms of groups of things rather than individual things.

Examples:

- Describe a situation in which the total number of objects can be expressed as 8 x 6. *Sample Solution: There are 8 books on each of 6 shelves.*
- Write a situation that can be represented by the product of 4 and 7. *Sample Solution: Johnny has 4 cars in each of 7 boxes.*
- Interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.*

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Products and Quotients 3.AR.A.1 3.AR.A.2 3.AR.A.4 3.AR.B.6 3.NOF.B.4	**Understands and** interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.
	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **both factors greater than 5 and less than or equal 10.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **one factor greater than or equal to 5.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.
	Represents a multiplication or division context as an equation.			
	Fluently multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	**Fluently** multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.

3.AR.A.2 Interpret whole-number quotients of whole numbers (i.e., dividends and divisors).

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.AR.A.1 **3rd Grade Standard Taught Concurrently:** 3.AR.B.6	Conceptual Understanding
Foundational Skills: 2. Know all quotients of numbers within 100 by memory.		

Examples and Explanations

In grade 3, two distinct models of division are essential. Students must partition models and use measurement (repeated subtraction) models.

Partition models provide students with a total number and the number of groups. These models focus on the question, "How many objects are in each group so that the groups are equal?" A context for partition models would be: There are 12 cookies on the counter. If you are sharing the cookies equally among three bags, how many cookies will go in each bag?

Measurement (repeated subtraction) models provide students with a total number and the number of objects in each group. These models focus on the question, "How many equal groups can you make?" A context for measurement models would be: There are 12 cookies on the counter. If you put 3 cookies in each bag, how many bags will you fill?

> *Solution: The student draws a model similar to the one below and indicates that 4 bags of 3 cookies can be made using 12 cookies.*

Example

- Interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Products and Quotients 3.AR.A.1 3.AR.A.2 3.AR.A.4 3.AR.B.6 3.NOF.B.4	**Understands and** interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.
	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **both factors greater than 5 and less than or equal 10.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **one factor greater than or equal to 5.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.
	Represents a multiplication or division context as an equation.			
	Fluently multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	**Fluently** multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.

3.AR.A.3 Use multiplication and division within 100 to solve real-world mathematical tasks in situations involving equal groups, arrays, and measurement quantities.

a. Represent these situations by using models, drawings, and equations with a symbol for the unknown number to represent the problem.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.AR.A.1, 3.AR.A.2 **3rd Grade Standard Taught Concurrently:** 3.AR.A.4; 3.AR.B.6	Application
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory.		

Examples and Explanations

This standard references various problem-solving contexts and strategies that students are expected to use while solving real-world problems involving multiplication and division. Students should use a variety of representations for creating and solving one-step real-world problems, such as: If you share 36 brownies among 9 people, how many brownies does each person receive? *(36 ÷ 9= 4).*

Table 2* gives examples of a variety of problem-solving contexts in which students need to find the product, the group size, or the number of groups. Students should be given ample experiences to explore all of the different problem structures. Students in third grade should use a variety of pictures, such as stars, boxes, or circles, to represent unknown numbers. Letters are also introduced to represent unknowns in third grade (3.AR.C.7).

Examples:

- There are 24 desks in the classroom. If the teacher puts 6 desks in each row, how many rows are there?[2]

  This task can be solved by drawing an array by putting 6 desks in each row until there are a total of 24 boxes in the array. This is an array model. *4 rows of 6 desks is 24 desks*

[2] https://www.illustrativemathematics.org/content-standards/3/OA/A/3/tasks/365

This task can also be solved by drawing pictures of equal groups.

Solution: 4 groups of 6 equals 24 objects, so 4 rows are needed.

$$24 \div 6 = \triangle$$

- Max the monkey loves bananas. Molly, his trainer, has 24 bananas. If she gives Max 4 bananas each day, how many days will the bananas last? This example uses measurement division, where the size of the groups is known.

Starting	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
24	24 – 4 = 20	20 – 4 = 16	16 – 4 = 12	12 – 4 = 8	8 – 4 = 4	4 – 4 = 0

Solution: The bananas will last for 6 days. Note: The solution shows as a series of steps, but could be completed in one step using 24 ÷ 4 = 6.

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Solve Multiplication and Division Problems 3.OA.A.3	Uses multiplication and division within 100 to solve word problems involving equal groups, arrays, **area, and measurement quantities other than area, with both factors** greater than 5 and less than or equal to 10.	Uses multiplication and division within 100 to solve word problems involving equal groups and arrays, with **one factor greater than or equal to 5 and less than or equal to 10.**	Given a visual aid, uses multiplication and division within 100 to solve word problems involving equal groups **and arrays**, with both factors less than or equal to 5**, or with one factor of 10**.	Given a visual aid, uses multiplication and division within 100 to solve word problems involving equal groups, with both factors less than or equal to 5.
	Identifies contexts given a numerical expression involving multiplication and division.			

3.AR.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers by representing the situation with a model or drawing and solving for the unknown.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.AR.A.3; 3.NOF.B.4	Conceptual Understanding
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory.		

Examples and Explanations

Note that the focus of 3.AR.A.4 extends beyond the traditional notion of *fact families* by having students explore the inverse relationship of multiplication and division.

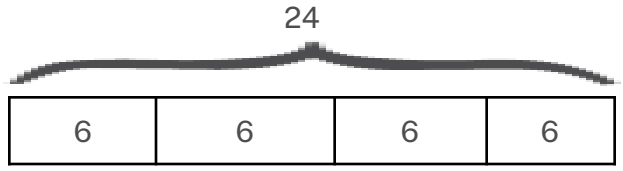
Students extend work from earlier grades with their understanding of the meaning of the equal sign as "the same amount as" to interpret an equation with an unknown. When given $4 \times ? = 40$, they might think:

- 4 groups of some number is the same as 40
- 4 times some number is the same as 40
- I know that 4 groups of 10 is 40, so the unknown number is 10
- 10 is the missing number because 4 times 10 equals 40.

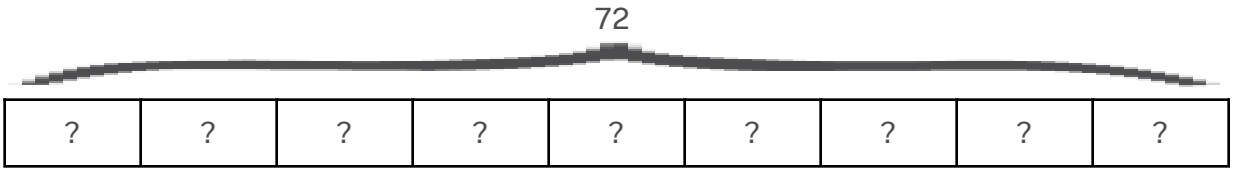
Students should have practice solving both multiplication and division equations with the unknown number in varying positions.

Examples:

- $24 = ? \cdot 6$



- 72 ÷△ = 9



This standard is strongly connected to 3.AR.A.3 when students solve problems and determine unknowns in equations. Table 2 at the end of this document shows equations for the different types of multiplication and division problem structures. The easiest problem structure includes *Unknown Product* (3 × 6 = ? or 18 ÷ 3 = 6). The more difficult problem structures include *Group Size Unknown* (3 × ? = 18 or 18 ÷ 3 = 6) or *Number of Groups Unknown* (? × 6 = 18, 18 ÷ 6 = 3).

- *For example, determine the unknown number that makes the equation true in each of the equations*
  - *8 X ? = 48*
  - *5 = □ ÷ 3*
  - *6 X 6 = ?*

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Products and Quotients 3.AR.A.1 3.AR.A.2 3.AR.A.4 3.AR.B.6 3.NOF.B.4	**Understands and** interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.
	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **both factors greater than 5 and less than or equal 10.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **one factor greater than or equal to 5.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.
	Represents a multiplication or division context as an equation.			
	Fluently multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	**Fluently** multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.

B. Understand properties of multiplication and the relationships between multiplication and division. In this cluster, the terms students should learn to use with increasing precision are **operation, multiply, divide, factor, product, quotient, unknown,** and **properties**.

3.AR.B.5 Apply properties of operations as strategies to multiply and divide.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.AR.A.1; 3.AR.A.2 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory.		

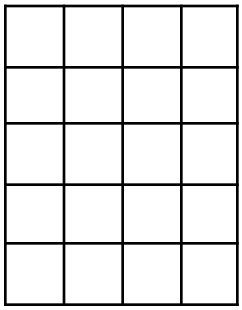
Examples and Explanations

This standard references properties of multiplication. **While students do not need to use the formal terms for these properties, students must understand that properties are rules about how numbers work, and they need to be able to flexibly and fluently apply each of them in various situations.** Students represent expressions using various objects, pictures, words, and symbols in order to develop their understanding of properties. They multiply by 1 and 0 and divide by 1. They change the order of numbers to determine that the order of numbers does not make a difference in multiplication (but does make a difference in division). Given three factors, they investigate changing the order of how they multiply the numbers to determine that changing the order does not change the product. They also decompose numbers to build fluency with multiplication.

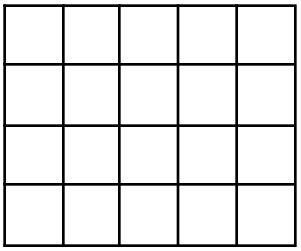
The associative property (grouping property) states that the sum or product stays the same when the grouping of addends or factors is changed. For example, when a student multiplies $7 \times 5 \times 2$, a student could rearrange the numbers to first multiply $5 \times 2 = 10$ and then multiply $10 \times 7 = 70$.

The commutative property (order property) states that the order of numbers does not matter when you are adding or multiplying numbers. For example, if a student knows that $5 \times 4 = 20$, then they also know that $4 \times 5 = 20$.

While rows are horizontal and columns are vertical, there is no "fixed" way to write the dimensions of an array as rows x columns or columns x rows. Students should have flexibility in being able to describe both dimensions of an array.



4 × 5
or
5 × 4



4 × 5
or
5 × 4

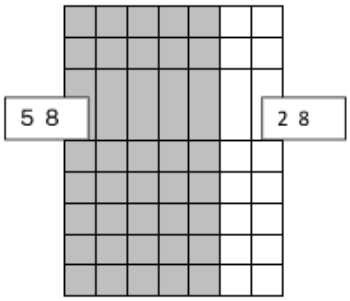
Students are introduced to the distributive property of multiplication over addition as a strategy for using products they know to solve products they don't know. Students would be using mental math to determine a product. Here are ways that students could use the distributive property to determine the product of 7 · 6. Again, students should use the distributive property, but can refer to this in informal language such as "breaking numbers apart."

Student 1
7 × 6
7 × 5 = 35
7 × 1 = 7
35 + 7 = 42

Student 2
7 × 6
7 × 3 = 21
7 × 3 = 21
21 + 21 = 42

Student 3
7 × 6
5 × 6 = 30
2 × 6 = 12
30 + 12 = 42

Another example of the distributive property uses an array model to help students determine the products and factors of problems by breaking numbers apart. For example, for the problem 7 · 8 = ?, students can decompose the 7 into 5 and 2, and reach the answer by multiplying 5 · 8 = 40 and 2 · 8 =16 and adding the two products (40 + 16 = 56).



To further develop understanding of properties related to multiplication and division, students use different representations and their understanding of the relationship between multiplication and division **to determine if the following types of equations are true or false.** Students are not required to state the name of the property.

- $0 \times 7 = 7 \times 0 = 0$ (Zero Property of Multiplication)
- $1 \times 9 = 9 \times 1 = 9$ (Multiplicative Identity Property of 1)
- $3 \times 6 = 6 \times 3$ (Commutative Property)
- $8 \div 2 = 2 \div 8$ (Students are only to determine that these are not equal.)
- $2 \times 3 \times 5 = 6 \times 5$
- $10 \times 2 < 5 \times 2 \times 2$
- $2 \times 3 \times 5 = 10 \times 3$
- $0 \times 6 > 3 \times 0 \times 2$

Examples:

- *If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.)*
- *3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.)*
- *Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)*

*Although this standard does not have Achievement Level Descriptors, it supports students' understanding of grade-level expectations.

Assessment Connections

Assessment Item Type(s): Type II
Evidence Statement(s): LEAP.II.3.1, LEAP.II.3.5

3.AR.B.6 Understand division as an unknown-factor problem, providing an explanation that leverages the relationship between multiplication and division.

Standard Overview

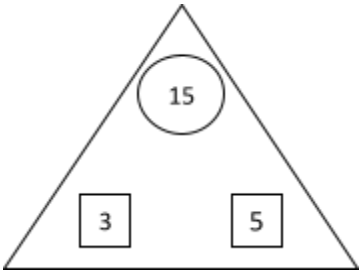
Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.AR.A.1; 3.AR.A.2; 3.AR.A.3	Conceptual Understanding
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory.		

Examples and Explanations

Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient.

Examples:

- $3 \cdot 5 = 15 \quad 5 \cdot 3 = 15$
- $15 \div 3 = 5 \quad 15 \div 5 = 3$



Example:

- Sarah did not know the answer to 63 divided by 7, but she does know her multiplication facts. Explain how Sarah can use her multiplication facts to find the answer to 63 divided by 7.

This standard refers to unknown-factor problems. It is strongly connected to 3.AR.A.3 when students solve real-world problems and determine unknowns in equations. These are *Group Size Unknown* and *Number of Groups Unknown* problems, as shown in Table 2 found at the end of this document. Since multiplication and division are inverse operations, students are expected to solve real-world problems as indicated in 3.AR.A.3 and explain their processes of solving division problems that can also be represented as unknown factor multiplication problems.

Example:

- Bob knows that 2 · 9 = 18. How can he use that fact to determine the answer to the following question: 18 people are divided into pairs in P.E. class? How many pairs are there? Write a division equation and explain your reasoning.
- *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.II.3.2, LEAP.II.3.5, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Products and Quotients 3.AR.A.1 3.AR.A.2 3.AR.A.4 3.AR.B.6 3.NOF.B.4	**Understands and** interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.	Interprets products and quotients of whole numbers.
	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **both factors greater than 5 and less than or equal 10.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with **one factor greater than or equal to 5.**	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.	Determines the unknown whole number in a multiplication or division problem by relating multiplication and division, with both factors less than or equal to 5, or with one factor of 10.
	Represents a multiplication or division context as an equation.			
	Fluently multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	**Fluently** multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.	Multiplies and divides within 100, using strategies relating multiplication and division or properties of operations.

C. Solve real-world mathematical tasks involving the four operations and identify and explain patterns in arithmetic.
In this cluster, the terms students should learn to use with increasing precision are **operation**, **multiply**, **divide**, **factor**, **product**, **quotient**, **subtract**, **add**, **addend**, **sum**, **difference**, **equation**, **expression**, **unknown**, **reasonableness**, **mental computation**, **estimation**, **rounding**, **patterns**, and **properties**.

3.AR.C.7 Solve real-world mathematical tasks involving at least two steps and using at least two of the four operations.

a. Represent these problems using equations with a letter standing for the unknown quantity.
b. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.AR.A.1 **3rd Grade Standard Taught in Advance:** 3.AR.A.3 **3rd Grade Standard Taught Concurrently:** 3.NOF.B.4; 3.DM.A.1; 3.DM.B.2; 3.DM.D.7	Conceptual Understanding, Application
Foundational Skills: 1. Know all products of two one-digit numbers from memory. 2. Know all quotients of numbers within 100 by memory. 3. Fluently add and subtract within 1,000. 5. Estimate and round whole numbers to the nearest 10 and 100.		

Examples and Explanations

Students in third grade begin the step to formal algebraic language by using a letter for the unknown quantity in equations for one and two-step problems. However, the symbols of arithmetic, · for multiplication and ÷ for division, continue to be used in Grades 3, 4, and 5.
This standard refers to two-step word problems using the four operations. The size of the numbers should be limited to related third-grade standards (e.g., 3.NOF.B.4 and 3.NOF.C.6). Adding and subtracting numbers should include numbers within 1,000, and multiplying and dividing numbers should include single-digit factors and products less than 100. This standard calls for students to represent problems using equations with a letter to represent unknown quantities.

Example:

- Mike runs 2 miles a day. His goal is to run 25 miles. After 5 days, how many miles does Mike have left to run in order to meet his goal? Write an equation and find the solution. ($2 \cdot 5 + m = 25; m = 15$)

This standard refers to estimation strategies, including using compatible numbers (numbers that sum to 10, 50, or 100) or rounding. The focus in this standard is to have students use and discuss various strategies. Students should estimate during problem solving, and then revisit their estimate to check for reasonableness.

Examples of typical estimation strategies:

- On a vacation, your family travels 267 miles on the first day, 194 miles on the second day and 34 miles on the third day. How many total miles did they travel?

Student 1	Student 2	Student 3
I first thought about 267 and 34. I noticed that their sum is about 300. Then I knew that 194 is close to 200. When I put 300 and 200 together, I get 500.	I first thought about 194. It is really close to 200. I also have 2 hundreds in 267. That gives me a total of 4 hundreds. Then I have 67 in 267 and 34. When I put 67 and 34 together that is really close to 100. When I add that hundred to the 4 hundreds that I already had, I end up with 500.	I rounded 267 to 300. I rounded 194 to 200. I rounded 34 to 30. When I added 300, 200, and 30, I know my answer will be about 530.

- This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.I.3.2, LEAP.I.3.3, LEAP.II.3.5, LEAP.II.3.6, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Two-Step Problems 3.AR.C.7 LEAP.I.3.2 LEAP.I.3.3	Solves two-step **unscaffolded** word problems using the four operations, **including rounding where appropriate**, in which the unknown is in a variety of positions **and both** values for each operation performed are substantial (towards the upper limits as defined by the standard assessed).	Solves two-step scaffolded word problems using the four operations **in which the unknown is in a variety of positions,** and one value for each operation performed is substantial (towards the upper limits as defined by the standard assessed).	Solves two-step scaffolded word problems using the four operations, in which the sum, difference, product, or quotient is always the unknown, **and one value for each operation performed is substantial (towards the upper limits as defined by the standard assessed).**	Solves two-step scaffolded word problems using the four operations, in which the sum, difference, product, or quotient is always the unknown.

3.AR.C.8 Identify, create, and extend arithmetic patterns and explain them using properties of operations without the formal language of the properties.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.AR.B.3 **3rd Grade Standard Taught in Advance:** 3.AR.B.5 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

This standard calls for students to examine, create, and extend arithmetic patterns involving both addition and multiplication (including patterns in the addition table or multiplication table). Arithmetic patterns are patterns that change by the same rate, such as adding the same number. For example, the series 2, 4, 6, 8, 10 is an arithmetic pattern that increases by 2 between each term. This standard also mentions identifying patterns related to the properties of operations. For example, identify why products in the 5's column end in zero or five on a multiplication table. Or explain why products of 4 times a number are always even, using the associative property (e.g., 4 x 6 = 2 x (2 x 6)).

Examples:

- Even numbers are always divisible by 2. Even numbers can always be decomposed into 2 equal addends
  (14 = 7 + 7).
- Multiples of even numbers (2, 4, 6, and 8) are always even numbers.
- On a multiplication chart, the products in each row and column increase by the same amount (skip counting).
- On an addition chart, the sums in each row and column increase by the same amount.
- What do you notice about the numbers highlighted in pink in the multiplication table? Explain a pattern using properties of operations.
- Observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
- The teacher tells the students to create an arithmetic pattern that increases by 4, starting with the number 5. The students create the pattern: 5, 9, 13, 17, 21. The student explains, "I started at 5 and added 4 each time to make my pattern. Each number is 4 more than the number before it.

·	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Sample Solution: If you look at column 6 and row 5, you are multiplying 6 · 5, and you get 30. If you look at column 5 and row 6, you are multiplying 5 · 6, and you still get 30. The order (commutative) property says the order in which you multiply two numbers doesn't matter, and the chart shows that you get a product of 30 either way.

*Although this standard does not have Achievement Level Descriptors, it supports students' understanding of grade-level expectations.

Assessment Connections

Assessment Item Type(s): Type II
Evidence Statement(s): LEAP.II.3.1, LEAP.II.3.5

D. Compare whole numbers.

■ **3.AR.D.9** Using understanding of the base-ten system:

a. Compare whole numbers up to 100,000, using >, =, and < symbols to record the results of comparisons.
b. Order a set of whole numbers up to 100,000.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** ■ 2.NOF.B.5 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** none	Procedural Skill and Fluency
Foundational Skills: 4. Compare numbers up to 100,000, identifying greater than, less than, or equal to.		

Examples and Explanations

Students use their understanding of the base-ten system by comparing digits starting from the largest place value and moving to the right. They see that the value of each digit depends on its place. When ordering numbers, students apply this same reasoning to determine which numbers are greater or smaller, then arrange them in a sequence.

Example

A student is given the numbers 45,697 and 45,786 and is told to use the symbols >, =, or < to compare the two numbers.

The student compares the two numbers and writes, 45,697 < 45,786

The student explains, “Both numbers have 45 thousand, but when I compare the hundreds, 6 hundreds is less than 7 hundreds, so 45,697 is less than 45,786”.

The student compared the numbers by looking at the greatest place value first and moving to the right as needed. Using this reasoning, the student can also order numbers from least to greatest.

*Although this standard does not have Achievement Level Descriptors, it supports students' understanding of grade-level expectations.

Geometric Reasoning and Logic

A. Reason with shapes and their attributes. In this cluster, the terms students should learn to use with increasing precision are **attributes, features, quadrilateral, open figure, closed figure, three-sided, 2-dimensional, subcategories of quadrilaterals, polygon, rhombus/rhombi/rhombuses, rectangle, square, partition, unit fraction, kite, parallelogram, examples, right angle,** and **non-examples**.

3.GL.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals).

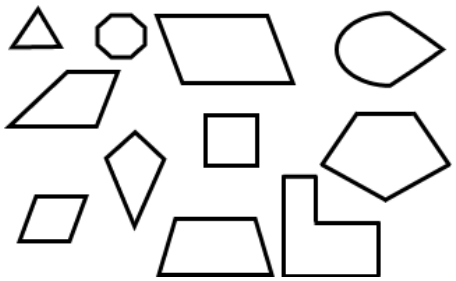
a. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** 2.GL.A.1 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency

Examples and Explanations

In third grade, students identify and draw triangles, quadrilaterals, pentagons, and hexagons. Third graders build on this experience and further investigate quadrilaterals (technology may be used during this exploration). Students recognize shapes that **are and are not** quadrilaterals by examining the properties of the geometric figures. They conceptualize that a quadrilateral must be a closed figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides. Students should be encouraged to provide details and use proper vocabulary when describing the properties of quadrilaterals. They sort geometric figures (see examples below) and identify squares, rectangles, and rhombuses as quadrilaterals.



Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): none

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Understanding Shapes 3.GL.A.1	Understands the properties of quadrilaterals and the subcategories of quadrilaterals.	**Understands the properties** of quadrilaterals and the subcategories of quadrilaterals.	Identifies examples of quadrilaterals and the subcategories of quadrilaterals.	Identifies examples of quadrilaterals and the subcategories of quadrilaterals.
	Recognizes **and sorts** examples of quadrilaterals with shared attributes and **shows** that shared attributes can define a larger category.	Recognizes examples of quadrilaterals with shared attributes and that shared attributes can define a larger category.	**Recognizes examples of quadrilaterals with shared attributes and that shared attributes can define a larger category.**	
	Draws examples and **non-examples** of quadrilaterals with specific attributes.	**Draws examples of quadrilaterals with specific attributes.**		

3.GL.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

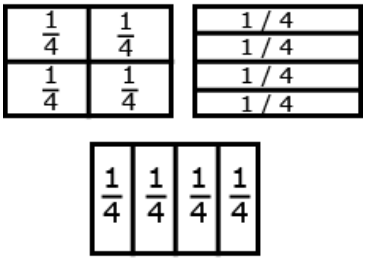
Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.NOF.A.1 **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency

Examples and Explanations

In third grade, students start to develop the idea of a fraction more formally, building on the idea of partitioning a whole into equal parts. The whole can be a shape such as a circle or a rectangle. In Grade 4, this is extended to include wholes that are collections of objects.
This standard also builds on students' work with fractions and area. Students are responsible for partitioning shapes into halves, thirds, fourths, sixths, and eighths.

Given a shape, students partition it into equal parts, recognizing that these parts all have the same area. They identify the fractional name of each part and are able to partition a shape into parts with equal areas in several different ways.



Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): none

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Perimeter and Area 3.GL.A.2 3.DM.D.7 LEAP.I.3.5	Solves **real-world and** mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and provides examples of rectangles **with the same perimeter and different areas or** with the same area and different perimeters.	Solves mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, **finding an unknown side length**, and **provides examples of** rectangles with the same area and different perimeters.	Solves mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, **and identifying rectangles with the same area and different perimeters.**	Solves mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths.
	Partitions shapes into parts with equal areas and expresses the area as a unit fraction of the whole.			

Data Analysis & Measurement

A. Solve problems involving measurement and estimation of liquid volumes and masses of objects. In this cluster, the terms students should learn to use with increasing precision are estimate, time, time interval, minute, hour, elapsed time, a.m., p.m., measure, liquid volume, mass, standard units, metric, gram (g), kilogram (kg), liter (l), and milliliter (ml).

3.DM.A.1 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).

a. Add, subtract, multiply, or divide to solve one-step real-world mathematical tasks involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.DM.A.1 **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.NOF.A.1, 3.AR.C.7	Conceptual Understanding, Procedural Skill and Fluency, Application

Examples and Explanations

Students need multiple opportunities to fill containers to help them develop a basic understanding of the volume of a liter, and to use a balance scale to understand grams and kilograms. While not required by the standard, it may be beneficial to use milliliters to show amounts that are less than a liter. Doing so would emphasize the relationship between smaller and larger units in the same system. Word problems should only be one-step and include the same units.

Foundational understandings to help with measure concepts:

- Understand that larger units can be subdivided into equivalent units (partition).
- Understand that the same unit can be repeated to determine the measure (iteration).
- Understand the relationship between the size of a unit and the number of units needed (compensatory principle).

Examples:

- This activity helps develop gram benchmarks.
    - Students identify 5 things that have a mass of about one gram. They record their findings with words and pictures. (Students can repeat this for 5 grams and 10 grams.)
    - One large paperclip has a mass of about one gram. A box of large paperclips (100 clips) has a mass of about 100 grams, so 10 boxes would have a mass of about one kilogram.
- Jose has 9 nickels. His nickels have a total mass of 45 grams. All nickels have the same mass. What is the mass of one nickel? *Solution: 5 grams*
- A water company has two large containers of water. One container has 124 liters of water. The second container has 379 liters of water. What is the total number of liters in the two containers?[3] *Solution: 503 liters*

[3] https://www.illustrativemathematics.org/content-standards/3/MD/A/2/tasks/1929

Assessment Connections

Assessment Item Type(s): Type I, III
Evidence Statement(s): LEAP.1.3.4, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Solve Measurement and Estimation Problems 3.DM.A.1 LEAP.I.3.4	Using grams, kilograms, or liters, measures, estimates, and solves word problems involving liquid volumes and masses of objects using any of the four basic operations, **including number values towards the higher end of the acceptable values for each operation.**	Using grams, kilograms, or liters, measures, estimates, **and solves word problems involving** liquid volumes and masses of objects **using any of the four basic operations**.	Using grams, kilograms, or liters, measures **and estimates** liquid volumes and masses of objects (beakers, measuring cups, scales)**.**	Using grams, kilograms, or liters, measures liquid volumes and masses of concrete objects (beakers, measuring cups, scales).
	Uses estimated measurements **to compare answers** to word problems.	**Uses estimated measurements, when indicated, to answer word problems.**		
	Evaluates usefulness and accuracy of estimations.			

B. Represent and interpret data. In this cluster, the terms students should learn to use with increasing precision are **scale, scaled picture graph, scaled bar graph, line plot,** and **data**.

3.DM.B.2 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

a. Solve one- and two-step "how many more" and "how many less" real-world mathematical tasks using information presented in scaled bar graphs.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.AR.C.7	Procedural Skill and Fluency, Application

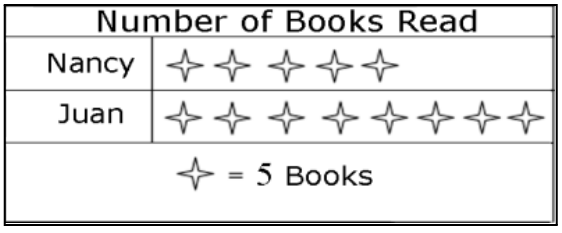
Examples and Explanations

Students' work with scaled graphs builds understanding of multiplication and division.

The following graphs provided below all use five as the scale interval, but students should experience different intervals to further develop their understanding of scale graphs and number facts.

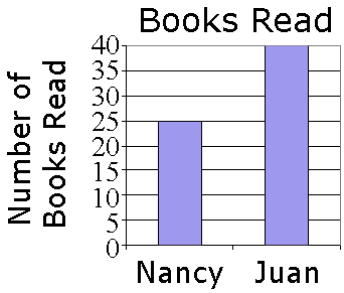
While exploring data concepts, students should pose a question, collect data, analyze data, and interpret data. Students should be graphing data that is relevant to their lives

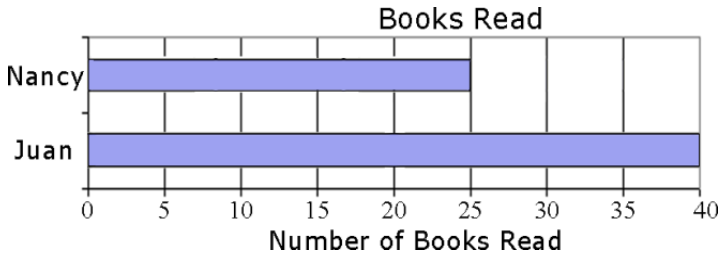
Pictographs: Scaled pictographs include symbols that represent multiple units. Below is an example of a pictograph with symbols that represent multiple units. Graphs should include a title, categories, category labels, key, and data.



- How many more books did Juan read than Nancy?

Scaled Bar Graphs: Students use both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data.





Analyze and Interpret Data (use the example single bar graphs on the previous page):

- How many more nonfiction books were read than fantasy books?
- Did more people read biography and mystery books or fiction and fantasy books?
- About how many books in all genres were read?
- Using the data from the graphs, what type of book was read more often than a mystery but less often than a fairytale?
- What interval was used for this scale?

Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): LEAP.1.3.6

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Scaled Graphs 3.DM.B.2 LEAP.I.3.6	Completes a scaled picture graph and a scaled bar graph to represent a data set.	Completes a scaled picture graph and a scaled bar graph to represent a data set.	**Completes** a scaled picture graph and a scaled bar graph to represent a data set**, with scaffolding, such as using a model as a guide.**	Identifies a correctly scaled picture graph and a correctly scaled bar graph to represent a data set.
	Solves one- and two-step "how many more" and "how many less" problems, **requiring a substantial addition, subtraction, or multiplication step**, using information presented in scaled bar graphs.	Solves one- **and two**-step "how many more" and "how many less" problems using information presented in scaled bar graphs.	Solves one-step "how many more" and "how many less" problems using information presented in scaled bar graphs.	Solves one-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

3.DM.B.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.

a. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units — whole numbers, halves, or quarters.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.NOF.A.2	Conceptual Understanding, Procedural Skill and Fluency

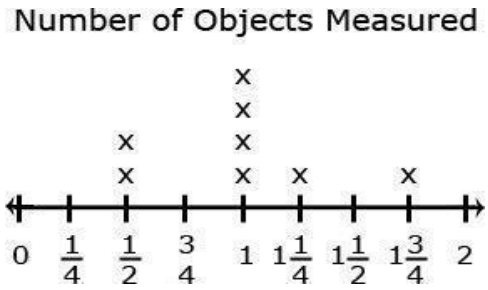
Examples and Explanations

Students in second grade measured length in whole units using both metric and U.S. customary systems. It's important to review with students how to read and use a standard ruler, including details about half and quarter marks on the ruler. Students should connect their understanding of fractions to measuring to one-half and one-quarter inch. Third graders need many opportunities to measure the length of various objects in their environment.

Some important ideas related to measuring with a ruler are:

- The starting point of where one places a ruler to begin measuring
- Measuring is approximate. Items that students measure will not always measure exactly ¼, ½ or one whole inch. Students will need to decide on an appropriate estimate length.
- Making paper rulers and folding to find the half and quarter marks will help students develop a stronger understanding of measuring length

Students generate data by measuring and creating a line plot to display their findings. An example of a line plot is shown below:



Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): none

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Measurement Data 3.MD.B.3	Generates measurement data by measuring lengths to the nearest half **and fourth** inch.	Generates measurement data by measuring lengths to the nearest half inch.	**Generates measurement data by measuring lengths to the nearest half inch.**	Identifies correct measurement from figures with appropriate scale provided.
	Shows the data by making a line plot, where the horizontal scale is marked in appropriate units of whole numbers, halves, **or quarters**.	Shows the data by making a line plot, where the horizontal scale is marked in appropriate units of whole numbers or halves.	**Shows the data by making a line plot, where the horizontal scale is marked in appropriate units of whole numbers or halves, with scaffolding.**	
	Uses the line plot to answer questions or solve problems.			

C. Understand concepts of area and relate area to multiplication and to addition. In this cluster, the terms students should learn to use with increasing precision are attribute, area, square unit, unit square, plane figure, gap, overlap, square cm, square m, square in., square ft., nonstandard units, tiling, side length, and decomposing.

3.DM.C.4 Recognize area as an attribute of plane figures and understand concepts of area measurement.

a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
b. A plane figure has an area of *n* square units if it can be covered entirely, without any gaps or overlaps, by n unit squares.

Standard Overview

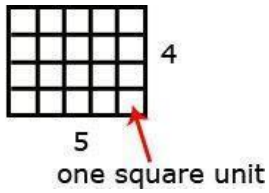
Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** 3.NOF.A.2	Conceptual Understanding (4, 4a, 4b)

Examples and Explanations

This standard calls for students to explore the concept of covering a region with "unit squares," which could include square tiles or shading on grid or graph paper. Based on students' development, they should have ample experiences filling a region with square tiles before transitioning to pictorial representations on graph paper.

Students develop an understanding of using square units to measure area by:

- Using different-sized square units
- Filling in an area with the same-sized square units and counting the number of square units



Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.II.3.4, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Area Measurement 3.DM.C.4 3.DM.C.5 3.MD.C.6	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.
	Understands area is measured using square units **and describes a visual model to show understanding that area that can be found by** covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by **covering a plane figure without gaps or overlaps with unit squares and counting them.**	With a visual model, understands area is measured using square units and determines area by counting given unit squares.
	Connects counting squares to multiplication when finding area.			
	Represents the area of a plane figure as "*n*" square units.	**Represents the area of a plane figure as "*n*" square units.**		

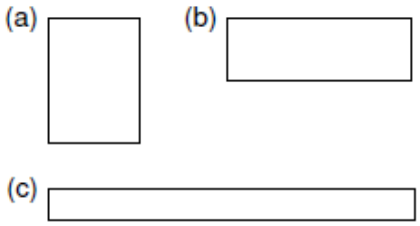
3.DM.C.5 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** 2.GL.A.2 **3rd Grade Standard Taught in Advance:** 3.DM.C.4 **3rd Grade Standard Taught Concurrently:** none	Procedural Skill and Fluency

Examples and Explanations

Using different-sized graph paper, students can explore the areas measured in square centimeters and square inches. For example, provide images such as the ones shown below on graph paper. Use masking tape to outline square meters and square feet on the floor of the classroom to help students understand the size of those units of measure.



Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.II.3.4, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Area Measurement 3.DM.C.4 3.DM.C.5 3.MD.C.6	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.
	Understands area is measured using square units **and describes a visual model to show understanding that area that can be found by** covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by **covering a plane figure without gaps or overlaps with unit squares and counting them.**	With a visual model, understands area is measured using square units and determines area by counting given unit squares.
	Connects counting squares to multiplication when finding area.			
	Represents the area of a plane figure as "*n*" square units.	**Represents the area of a plane figure as "*n*" square units.**		

3.DM.C.6 Relate area to the operations of multiplication and addition.

a. Find the area of a rectangle with whole-number side lengths by tiling it, and connect that the area is the same as multiplying the side lengths.
b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world mathematical tasks, and represent whole-number products as rectangular areas in mathematical reasoning.
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.DM.C.4, 3.DM.C.5 **3rd Grade Standard Taught Concurrently:** 3.AR.B.5, 3.AR.C.7	Conceptual Understanding (7, 7a, 7b, 7c), Procedural Skill and Fluency (7a, 7b), Application (7b)

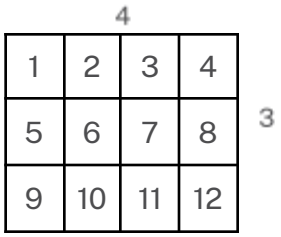
Examples and Explanations

Students can learn how to multiply length measurements to find the area of a rectangular region. But, to make sense of these quantities, they must first learn to interpret measurement of rectangular regions as a multiplicative relationship of the number of square units in a row and the number of rows. This relies on the development of spatial structuring. To build from spatial structuring to understanding the number of area-units as the product of number of units in a row and number of rows, students might draw rectangular arrays of squares and learn to determine the number of squares in each row with increasingly sophisticated strategies, such as skip-counting the number in each row and eventually multiplying the number in each row by the number of rows. They learn to partition a rectangle into identical squares by anticipating the final structure and forming the array by drawing line segments to form rows and columns. They use skip counting and multiplication to determine the number of squares in the array.

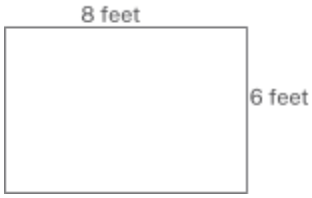
Examples:

- Given a rectangle with its dimensions labeled, students should draw an array within the rectangle and then multiply the length times the width to show that the area is the same as when the squares are counted.

  To find the area, one could count the squares or multiply 3 x 4 = 12.



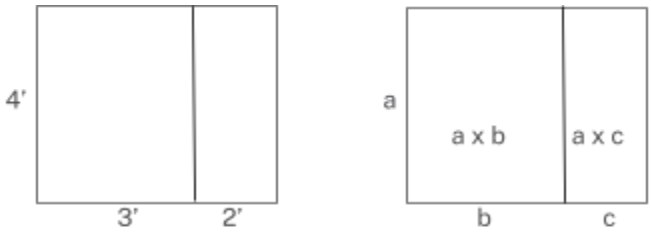
- Drew wants to tile the bathroom floor using 1-foot tiles. How many tiles will he need?



- Students might solve problems such as finding all the rectangular regions with whole-number side lengths that have an area of 12 area-units, doing this for larger rectangles (e.g., enclosing 24, 48, 72 area-units), making sketches rather than drawing each square. Students learn to justify their belief that they have found all possible solutions.

- Joe and John made a poster that was 4' by 3'. Mary and Amir made a poster that was 4' by 2'. They placed their posters on the wall side-by-side so that there was no space between them. How much area will the two posters cover?

  Students use pictures, words, and numbers to explain their understanding of the distributive property in this context.



$4 \times 3 + 4 \times 2 = 20$
$4(3 + 2) = 20$
$4 \times 5 = 20$

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.II.3.1, LEAP.3.II.3.4, LEAP.III.3.5, LEAP.III.3.7, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Area Measurement 3.DM.C.4 3.DM.C.5 3.MD.C.6	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.
	Understands area is measured using square units **and describes a visual model to show understanding that area that can be found by** covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by **covering a plane figure without gaps or overlaps with unit squares and counting them.**	With a visual model, understands area is measured using square units and determines area by counting given unit squares.
	Connects counting squares to multiplication when finding area.			
	Represents the area of a plane figure as "*n*" square units.	**Represents the area of a plane figure as "*n*" square units.**		

D. Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. In this cluster, the terms students should learn to use with increasing precision are **attribute, perimeter, plane figure, area, polygon,** and **side length**.

3.DM.D.7 Solve real-world mathematical tasks involving perimeters of polygons, including:

- finding the perimeter given the side lengths,
- finding an unknown side length, and
- exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 3.DM.C.4 **3rd Grade Standard Taught Concurrently:** 3.AR.C.7	Procedural Skill and Fluency, Application

Examples and Explanations

Students develop an understanding of the concept of perimeter by walking around the perimeter of a room, using rubber bands to represent the perimeter of a plane figure on a geoboard, or tracing around a shape on an interactive whiteboard. They find the perimeter of objects; use addition to find perimeters; and recognize the patterns that exist when finding the sum of the lengths and widths of rectangles.

Students use geoboards, tiles, and graph paper to find all the possible rectangles that have a given perimeter (e.g., find the rectangles with a perimeter of 14 cm). They record all the possibilities using dot or graph paper, compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles.

Given a perimeter and a length or width, students use objects or pictures to find the missing length or width. They justify and communicate their solutions using words, diagrams, pictures, numbers, and an interactive whiteboard.

Students use geoboards, tiles, graph paper, or technology to find all the possible rectangles with a given area (e.g., find the rectangles that have an area of 12 square units). They record all the possibilities using dot or graph paper, compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles. Students then investigate the perimeter of the rectangles with an area of 12.

area (sq. in.)	length (in.)	width (in.)	perimeter (in.)
12	1	12	26
12	2	6	16
12	3	4	14
12	4	3	14
12	6	2	16
12	12	1	26

The patterns in the chart allow the students to identify the factors of 12, connect the results to the commutative property, and discuss the differences in perimeter within the same area. This chart can also be used to investigate rectangles with the same perimeter. It is important to include squares in the investigation.

Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): LEAP.I.3.5

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Area Measurement 3.DM.C.4 3.DM.C.5 3.MD.C.6	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.
	Understands area is measured using square units **and describes a visual model to show understanding that area that can be found by** covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by **covering a plane figure without gaps or overlaps with unit squares and counting them.**	With a visual model, understands area is measured using square units and determines area by counting given unit squares.
	Connects counting squares to multiplication when finding area.			
	Represents the area of a plane figure as "*n*" square units.	**Represents the area of a plane figure as "*n*" square units.**		

E. Work with time and money. In this cluster, the terms students should learn to use with increasing precision are **penny, nickel, dime, quarter, bill** (as it relates to money)**, dollar symbol ($),** and **cent symbol (¢)**.

3.DM.E.8 Understand time to the nearest minute.

a. Tell, write, and represent time to the nearest minute and measure time intervals in minutes, within 60 minutes, on an analog and digital clock.
b. Calculate elapsed time greater than 60 minutes to the nearest quarter and half hour on a number line diagram.
c. Solve real-world mathematical tasks involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** none **3rd Grade Standard Taught Concurrently:** none	Conceptual Understanding (8, 8a), Procedural Skill and Fluency (8a, 8b), Application (8c)

Examples and Explanations

This standard calls for students to solve elapsed time problems, including word problems. Students should use clock models (analog and digital) or number lines. On the number line, students should be given the opportunities to determine the intervals and size of jumps on their number line. Students could use pre-determined number lines (intervals every 5 or 15 minutes) or open number lines (intervals determined by students).

Example:

- At 7 a.m., Candace wakes up to go to school. It takes her 8 minutes to shower, 9 minutes to get dressed, and 17 minutes to eat breakfast. How many minutes does she have until the bus comes at 8 a.m.? Use the number line to help solve the problem. Explain your work.

Assessment Connections

Assessment Item Type(s): Type I, II, III
Evidence Statement(s): LEAP.II.3.8, LEAP.III.3.1

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Time 3.MD.A.1	Tells, writes, and measures time to the nearest minute.	Tells, writes, and measures time to the nearest minute.	Tells, writes, and measures time to the nearest minute.	Tells, writes, and measures time to the nearest minute.
	Solves **two**–step word problems involving addition and subtraction of time intervals in minutes.	Solves one-step word problems involving addition or subtraction of time intervals in minutes.	Solves one-step word problems involving addition or subtraction of time intervals in minutes, **with scaffolding.**	

3.DM.E.9 Solve real-world mathematical tasks involving at least two steps and using the four operations with pennies, nickels, dimes, quarters, and bills greater than one dollar, using the $ and ¢ symbols appropriately.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** none **3rd Grade Standard Taught in Advance:** 2.DM.C.8 **3rd Grade Standard Taught Concurrently:** none	Application

Examples and Explanations

This standard requires students to solve problems involving bills that have a value greater than $1 and/or pennies, nickels, dimes, and quarters. **It is important to recognize that third-grade students do not have an understanding of decimal place values; therefore, the use of decimals is prohibited.**

Examples:

- Mary wants to buy candy that costs $4 a pound. She has 3 pounds of candy in her bag. When she goes to pay, she gives the clerk a $10 bill and a $5 bill. How much change should Mary get back? Explain two ways the clerk could use to give Mary her change. You should include different combinations of bills and coins in one of your responses. Explain how you know that both of your ways will work.
- Sam received $20 bills from 4 of his aunts on his birthday. He has a $10 bill and 12 one-dollar bills in his savings box at home. Does Sam have enough money to buy a bike that costs $125? Show your work or explain how you know.

Assessment Connections

Assessment Item Type(s): Type I
Evidence Statement(s): none

Achievement Level Descriptor				
Content	**Advanced**	**Mastery**	**Basic**	**Approaching Basic**
Area Measurement 3.DM.C.4 3.DM.C.5 3.MD.C.6	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.	Recognizes area as an attribute of plane figures.
	Understands area is measured using square units **and describes a visual model to show understanding that area that can be found by** covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by covering a plane figure without gaps or overlaps with unit squares and counting them.	With a visual model, understands area is measured using square units and determines area by **covering a plane figure without gaps or overlaps with unit squares and counting them.**	With a visual model, understands area is measured using square units and determines area by counting given unit squares.
	Connects counting squares to multiplication when finding area.			
	Represents the area of a plane figure as "*n*" square units.	**Represents the area of a plane figure as "*n*" square units.**		

Cross Content Connections

Mathematics supports understanding and skills across all disciplines. The ability to apply mathematics learning across disciplines allows students to transform abstract concepts into practical tools, deepen engagement, think critically, and apply mathematics to the real world.

English Language Arts

The connection between math and English language arts (ELA) begins in disciplinary literacy, which requires literacy skills in technical subjects, including the ability to decode complex word problems as narrative structures. Students must master the language of math by using ELA skills like reading comprehension and argumentative writing to explain their reasoning, prove theorems, and articulate the logic behind their numerical solutions.

Science

K-12 math and science are deeply integrated, with mathematics serving as the essential language that allows students to quantify, model, and analyze real-world phenomena they observe in science. As students progress, they use mathematics and computational thinking, ranging from simple data graphing to complex algebraic modeling, to turn raw scientific observations into evidence-based conclusions and predictable patterns. Explicit connections between the LSSM and Louisiana Student Standards for Science (LSSS) can be found on the Connections to K-12 ELA and Math document within the LSSS files.

Computer Science

The integration of mathematics and computer science is codified through state standards that treat computational thinking as a practical application of algebraic logic and problem-solving. Students use mathematical foundations, such as functions and data analysis, to build algorithms and write code that solves real-world challenges in Louisiana's growing technology and energy sectors. The Louisiana CS Frameworks make explicit connections and embed technology tools such as artificial intelligence to support students as they engage in math and computer science learning. Students can strategically use artificial intelligence tools to explore math ideas, test conjectures, analyze patterns and trends, and refine their thinking. The appropriate and skillful use of artificial intelligence in math requires students to use their mathematical reasoning to validate and critique artificial intelligence outputs in addition to naming how the use of artificial intelligence

supports and extends their thinking, understanding, and reasoning about concepts, ensuring the student maintains ownership of the mathematics, and leverages artificial intelligence as a resource.

Social Studies

The intersection of math and social studies is most evident in the analysis of historical data and economic trends, allowing students to quantify the impact of events such as the Great Flood of 1927 or the evolution of Louisiana's energy industry. By applying statistical tools to demographic shifts and geographic mapping, students move beyond historical content standards to demonstrate understanding of the skills and practices standards for social studies. Identifying and interpreting mathematical patterns strengthens students' ability to recognize trends that have shaped the geographical, economic, political, and cultural landscape of our state, nation, and world.

Leveraging Lower Grade Standards to Support Student Learning

Grade 1 Standards

1.GL.A.2 Compose two-dimensional shapes and three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape, building understanding of the part:whole relationships. Return to 3.DM.C.4

1.GL.A.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves, fourths, and quarters*, and use the phrases *half of, fourth of, and quarter of*. Describe the whole as two of, or four of the shares.

a. Understand for these examples that decomposing into more equal shares creates smaller shares.
b. Identify examples and non-examples of halves and fourths. Return to 3.NOF.A.1

Grade 2 Standards

2.AR.A.1 Use addition and subtraction within 100 to solve one- and two-step real-world mathematical tasks involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions for one or two operations.

a. Represent these situations using models and equations, elevating the concrete-representational-abstract instructional framework. Return to 3.AR.C.7

2.AR.B.3 Determine whether a group of objects (up to 20) has an odd or even number of members.

a. Represent these situations by pairing objects or counting them by 2s.
b. Write an equation to express an even number as a sum of two equal addends.

Return to 3.AR.A.1, 3.AR.C.8

2.AR.B.4 Use addition to find the total number of objects arranged in equal groups and rectangular arrays with up to 5 rows and up to 5 columns.

a. Write an equation to express the total as a sum of equal addends (a repeated addition equation).

Return to 3.AR.A.1

2.NOF.B.2 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones. Understand the following as special cases:

- 100 can be thought of as a bundle of ten tens — called a "hundred."
- The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

Return to 3.NOF.C.5, 3.NOF.C.7

2.NOF.B.5 Compare two three-digit numbers based on values of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons. Return to 3.AR.D.9

2.AR.A.2 Add and subtract up to 1000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the part: whole relationship between addition and subtraction.

a. Understand that in adding or subtracting three-digit numbers, add or subtract hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
b. Justify the reasoning with a written explanation when choosing a model or strategy to add or subtract.

Return to 3.NOF.C.6

2.NOF.C.8 For a given number 100-900:

a. Mentally add 10 or 100; and
b. Mentally subtract 10 or 100.

Return to 3.NOF.C.6

2.DM.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. Return to 3.DM.A.1, 3.DM.C.4

2.DM.A.2 Measure the length of an object twice, using two different units of length (inches, feet, centimeters, or meters) or two different measurements.

a. Describe how the two measurements relate to the size of the unit chosen with a written response. Return to 3.NOF.A.1

2.DM.B.6 Create a number line diagram with equally spaced points corresponding to whole numbers (0, 1, 2, etc.), using 0 or another whole number as a starting point.

a. Recognize that each mark on a number line represents one whole number and that each position corresponds to a single value.
b. Represent whole numbers as lengths from 0.
c. Represent whole-number sums and differences up to 100 on a number line diagram. Return to 3.NOF.A.2

2.DM.C.8 Solve real-world mathematical tasks involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Return to 3.DM.E.9

2.GL.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces, with sizes being compared directly or visually. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. Return to 3.GL.A.1

2.GL.A.2 Apply spatial structuring to partition a rectangle into rows and columns of same-size units, interpreting both as a collection of units and as single units, and count to find the total number of units. The rectangle should not be divided up into more than 5 columns and 5 rows to correlate with 2.AR.B.4. Return to 3.DM.C.5

2.GL.A.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths.

a. Identify examples and non-examples of halves, thirds, and fourths.

Return to 3.NOF.A.1

Table 2. Common multiplication and division situations.[1]

	Unknown Product $3 \cdot 6 = ?$	Group Size Unknown ("How many in each group?" Division) $3 \cdot ? = 18$, and $18 \div 3 = ?$	Number of Groups Unknown ("How many groups?" Division) $? \cdot 6 = 18$, and $18 \div 6 = ?$
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all? *Measurement example.* You need 3 lengths of string, each 6 inches long. How much string will you need altogether?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag? *Measurement example.* You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?	If 18 plums are to be packed 6 to a bag, then how many bags are needed? *Measurement example.* You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays,[2] Area[3]	There are 3 rows of apples with 6 apples in each row. How many apples are there? *Area example.* What is the area of a 3 cm by 6 cm rectangle?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row? *Area example.* A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be? *Area example.* A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?
Compare	A blue hat costs $6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? *Measurement example.* A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?	A red hat costs $18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost? *Measurement example.* A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?	A red hat costs $18 and a blue hat costs $6. How many times as much does the red hat cost as the blue hat? *Measurement example.* A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	General $a \cdot b = ?$	$a \cdot ? = p$, and $p \div a = ?$	$? \cdot b = p$, and $p \div b = ?$

[1]The first examples in each cell are examples of discrete things. These are easier for students and should be given before the measurement examples.

[2]The language in the array examples shows the easiest form of array problems. A harder form is to use the terms rows and columns: The apples in the grocery window are in 3 rows and 6 columns. How many apples are in there? Both forms are valuable.
[3]Area involves arrays of squares that have been pushed together so that there are no gaps or overlaps, so array problems include these especially important measurement situations.