Standards Resource Guide

Grade 1

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.

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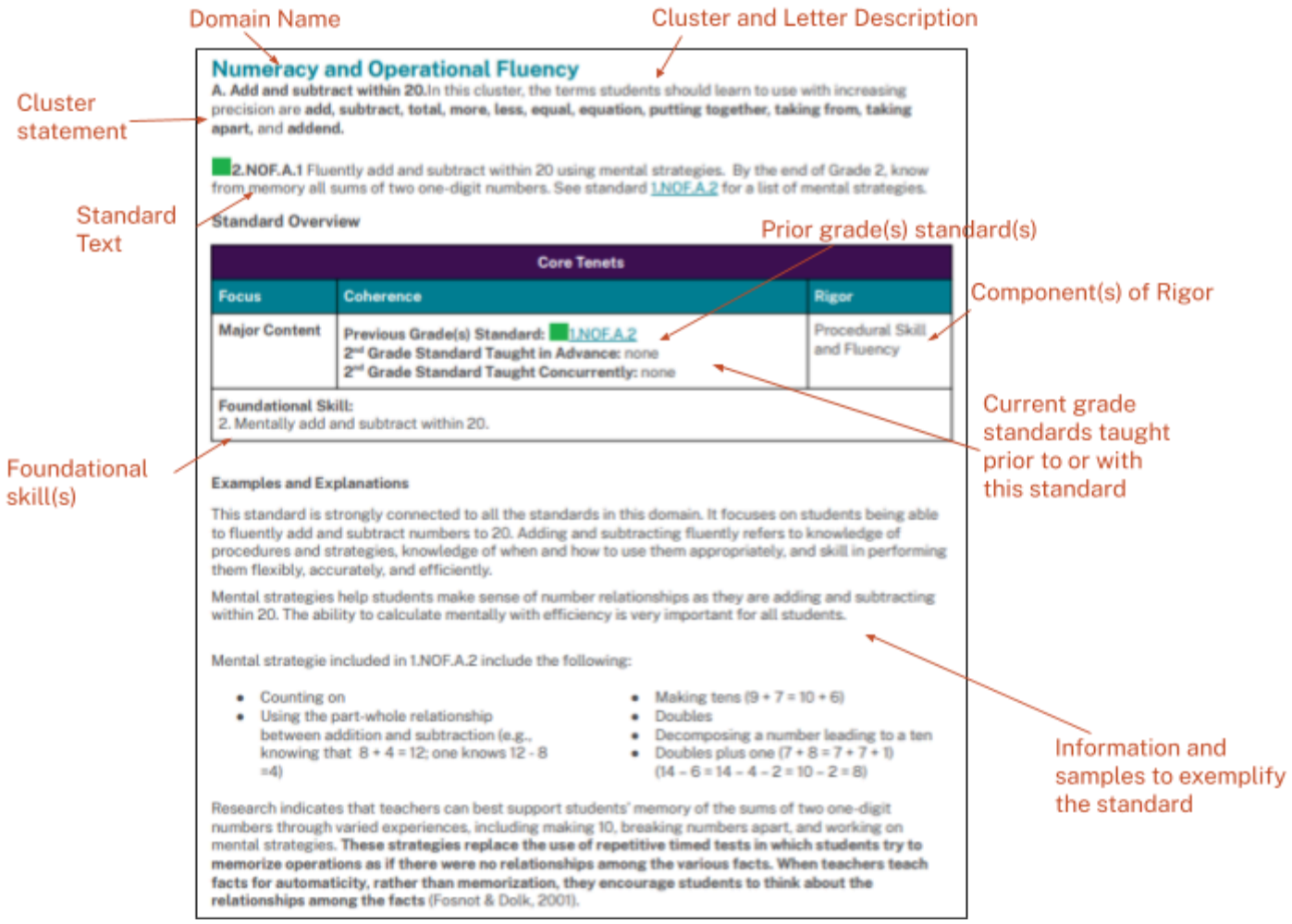
Louisiana Department of Education
doe.louisiana.gov | P.O. Box 94064 • Baton Rouge, LA • 70804-9064

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.

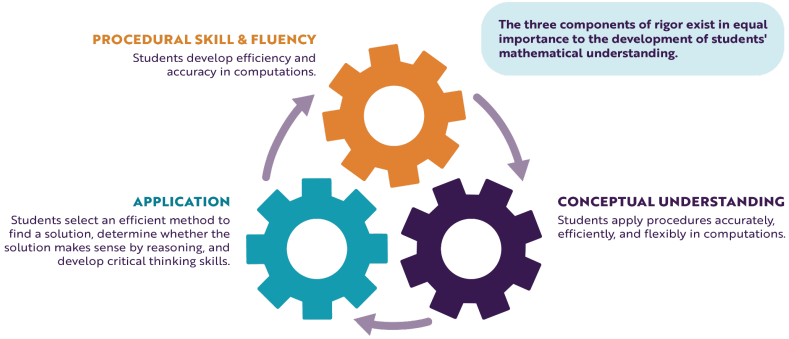
Classification of Major, Supporting, and Additional Work

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 within 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.

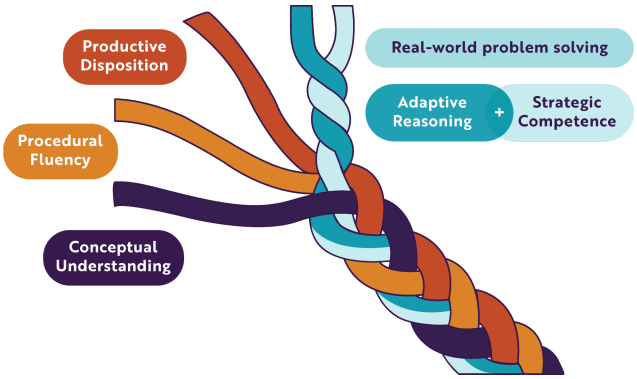
Focus calls for intentional emphasis on specific topics, skills, and ideas within grade-level mathematics instruction. Not all content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to 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 Solvin**g - 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 a conceptual understanding of mathematics. The first stage is where students build their concrete understanding of a concept through the use of manipulatives or other physical objects. 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

[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.

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 (1.AR.A.1)	**Real-World Mathematical Task** (1.AR.A.1)
17 children were in a class. 9 were boys, and the rest were girls. How many girls were in the class? • Solve. • Draw a picture to show how you solved it. • Write an equation to match the situation.	17 children were in the class. How many boys and how many girls could have been in the class? • Solve. • Draw a picture to explain your answer. • Write an equation to match the situation.

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 1 complete.

Louisiana Standards for Mathematical Practice (MP)	
Louisiana Standard	**Explanations and Examples**
1.MP.1 Make sense of problems and persevere in solving them.	In first grade, students realize 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. Younger students 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 are willing to try other approaches when having difficulty solving a problem.
1.MP.2 Reason abstractly and quantitatively.	Younger students recognize that a number represents a specific quantity. They connect the quantity to written symbols. Using reasoning with numbers requires creating a representation of a problem while focusing on the meaning of quantities.
1.MP.3 Construct viable arguments and critique the reasoning of others.	First graders construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They also practice their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" "Explain your thinking," and "Why is that true?" They not only explain their own thinking, but also listen to others' explanations. They decide if the explanations make sense and ask questions.
1.MP.4 Model with mathematics.	In early grades, students experiment with representing problem situations in multiple ways, including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart or list, 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.
1.MP.5 Use appropriate tools strategically.	In first grade, students begin to consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, first graders decide it might be best to use colored chips to model an addition problem.
1.MP.6 Attend to precision.	As young children begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and when they explain their own reasoning.
1.MP.7 Look for and make use of structure.	First graders begin to discern a pattern or structure. For instance, if students recognize *12 + 3 = 15, then they also know 3 + 12 = 15 (Commutative property of addition). To add 4 + 6 + 4, the first two numbers can be added to make a ten, so 4 + 6 + 4 = 10 + 4 = 14.*
1.MP.8 Look for and express regularity in repeated reasoning.	In the early grades, students notice repetitive actions in counting and computation, etc. When children have multiple opportunities to add and subtract "ten" and multiples of "ten," they notice the pattern and gain a better understanding of place value. Students continually check their work by asking themselves, "Does this make sense?"

Grade Level Expected Foundational Skills

By the end of grade 1, 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 1, but is comprised of the foundational skills required by the standards.

1. Fluently add and subtract within 10.
2. Identify equivalent sums or differences of one-digit numbers. Ex. 6 - 2 = 2 + 2
3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = □ - 3.
4. Given a two-digit number, mentally find 10 more or 10 less.
5. Count to 120 by 5's.
6. Read and write numbers through 120.
7. Compare numbers up to 100, identifying whether one number is *greater than, less than,* or *equal to* another.

Numeracy and Operational Fluency

A. Add and subtract. In this cluster, the terms students should learn to use with increasing precision are addition, putting together, adding to, making ten, subtraction, taking apart, taking from, equivalent, unknown, equal, equation, counting all, counting on, and counting back.

1.NOF.A.1 Relate counting to addition and subtraction. For example, counting on 2 to add 2.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance**: none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

Students may need help connecting 'counting on' with addition and 'counting back' with subtraction. When students count on 3 from 4, (5, 6, 7), they should write this as 4 + 3 = 7. When students count back (3) from 7, (6, 5, 4), they should connect this to 7 – 3 = 4. Students often have difficulty knowing where to begin their count when counting backward.

1.NOF.A.2 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.

a. Use mental strategies such as:
   - counting on or counting back;
   - using a number line or path;
   - making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14);
   - decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9);
   - using the part:whole relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and
   - creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.AR.A.2, K.AR.A.3, K.AR.A.4, K.NOF.D.7 **1st Grade Standard Taught in Advance:** 1.AR.B.3, 1.AR.B.4, 1.NOF.A.1 **1st Grade Standard Taught Concurrently:** 1.AR.A.1	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums or differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = □ - 3.		

Examples and Explanations

This standard is strongly connected to all the standards in this domain. In First Grade, students learn about and use various strategies to solve addition and subtraction problems. The use of objects, diagrams, or interactive whiteboards and various strategies will help students develop fluency.

When students repeatedly use strategies that make sense to them, they internalize facts and develop fluency for addition and subtraction within 10. Once students are able to demonstrate fluency within 10, they are accurate, efficient, and flexible. First Grade students then apply similar strategies for solving problems within 20, building the foundation for fluency to 20 in grade 2.

While not specifically included as a strategy in this standard, use of doubles is noted as a strategy in 1.AR.A.2 and implied in the last example in this standard (i.e., adding 6 + 7 by creating the known equivalent 6 + 6 + 1= 12 + 1 = 13).

1.NOF.A.3 Given a two-digit number, mentally find one more, 10 more, one less, or 10 less than a given number, without having to count.

a. Justify the reasoning used when computing mentally with an oral and/or written explanation.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 1. Fluently add and subtract within 10. 4. Given a two-digit number, mentally find 10 more or 10 less.		

Examples and Explanations

This standard requires students to understand and apply the concept of 10, which leads to future place value concepts. Extensive use of models such as base-ten blocks and 100s charts will help facilitate this understanding and will move students beyond simply rote counting by ten. It also helps students see the pattern involved when adding or subtracting 10. However, it is critical for students to mentally find 10 more or 10 less than the number by the end of the year.

Examples:

- 10 more than 43 is 53 because 53 is one more 10 than 43
- 10 less than 43 is 33 because 33 is one 10 less than 43

Students may use interactive versions of models (base-ten blocks, 100s charts, number lines, etc.) to develop understanding.

B. Extending the counting sequence. In this cluster, the terms students should learn to use with increasing precision are **numerals 0 through 120.**

1.NOF.B.4 Count to 120, starting at any number less than 120.

a. Count forward and backward to 120 by ones, fives, and tens.
b. In this range, read, write, and identify numerals and number names written in words.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.NOF.A.1 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 5. Count to 120 by 5's. 6. Read and write numbers through 120.		

Examples and Explanations

Students use objects, words, and/or symbols to express their understanding of numbers. They extend their counting beyond 100 to count up to 120 by counting by 1s. Some students may begin to count in groups of 10 (while other students may use groups of 2s or 5s to count). Counting in groups of 10 as well as grouping objects into 10 groups of 10 will develop students' understanding of place value concepts.

Students extend reading and writing numerals beyond 20 to 120.

Students should experience counting from different starting points (e.g., start at 83; count to 120). To extend students' understanding of counting, they should be given opportunities to count backwards by ones and tens. They should also investigate patterns in the base-ten system.

As first graders learn to understand that the position of each digit in a number impacts the value of the number, they become more aware of the order of the digits when they write numbers. For example, a student may write "17" and mean "71." Through teacher demonstration, opportunities to "find mistakes," and questioning by the teacher ("I am reading this and it says seventeen. Did you mean seventeen or seventy-one? How can you change the number so that it reads seventy-one?"). Students become precise as they write numbers to 120.

C. Understand place value. In this cluster, the terms students should learn to use with increasing precision are **tens, ones, bundle, left-overs, singles, groups, greater/less than, equal to, compare, digit, number, and numeral.**

1.NOF.C.5 Understand that the two digits of a two-digit number represent amounts of tens and ones.

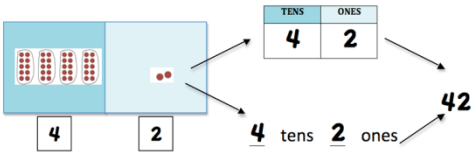
a. Read, write, and represent two-digit numbers up to 99 using base-ten numerals, standard form, word form, and unit form (i.e., 42 and 4 tens 2 ones). Understand the following as special cases:
   - 10 can be thought of as a bundle of ten ones — called a "ten."
   - The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
   - The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens and 0 ones.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.NOF.E.8 **1st Grade Standard Taught in Advance:** 1.NOF.B.4 **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 4. Given a two-digit number, mentally find 10 more or 10 less. 6. Read and write numbers through 120.		

Examples and Explanations

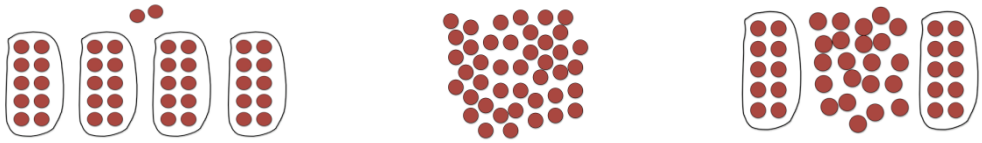
First-grade students are introduced to the idea that a bundle of ten ones is called "a ten." This is known as unitizing. When first-grade students unitize a group of ten ones as a whole unit ("a ten"), they are able to count groups as though they were individual objects. For example, 4 trains of ten cubes each have a value of 10 and would be counted as 40 rather than as 4. This is a monumental shift in thinking and can often be challenging for young children to consider a group of something as "one" when all previous experiences have been counting single objects. This is the foundation of the place value system and requires time and rich experiences with concrete manipulatives to develop.



A student's ability to conserve numbers is an important aspect of this standard. It is not obvious to young children that 42 cubes is the same amount as 4 tens and 2 leftovers. It is also not obvious that 42 could

also be composed of 2 groups of 10 and 22 leftovers. Therefore, first graders require **numerous** experiences with grouping proportional (see Teacher Notes at end of section) objects (e.g., cubes, beans, beads, ten-frames, sticks, straws) to make groups of ten, prior to using pre-grouped materials (e.g., base-ten blocks, pre-made bean sticks) that have to be "traded" or are non-proportional (e.g., money). (See note in the section for part c of this standard.)

Example: 42 cubes can be grouped many different ways and still remain a total of 42 cubes.



"We want children to construct the idea that all of these are the same and that the sameness is clearly evident by virtue of the groupings of ten. Groupings by tens is not just a rule that is followed, but that any grouping by tens, including all or some of the singles, can help tell how many." (Van de Walle & Lovin, p. 124) First-grade students extend their work from kindergarten when they composed and decomposed numbers from 11 to 19 into ten ones and some further ones. In kindergarten, everything was thought of as individual units: "ones." In first grade, students are asked to unitize those ten individual ones as a whole unit: "*one* ten." Students in first grade explore the idea that the teen numbers (11 to 19) can be expressed as *one* ten and some leftover ones. Ample experiences with a variety of groupable materials that are proportional (e.g., cubes, links, beans, beads) and ten frames help students develop this concept.

Example: Here is a pile of 12 cubes. Do you have enough to make a ten? Would you have any left over? If so, how many leftovers would you have?

Student A
I filled a ten-frame to make one ten and had two counters left over. I had enough to make a ten with some left over.
The number 12 has 1 ten and 2 ones.

Student B
I counted out 12 cubes. I had enough to make 10. I now have 1 ten and 2.

In addition, when learning about forming groups of 10, first-grade students learn that a numeral can stand for many different amounts, depending on its position or place in a number. This is an important realization as young children begin to work through reversals of digits, particularly in the teen numbers.

Example: Are 19 and 91 the same or different numbers?

Students: Different!
Teacher: Why do you think so?
Students: Even though they both have a one and a nine, the top one is nineteen. The bottom one is ninety-one.
Teacher: Is that true some of the time, or all of the time? How do you know? (Teacher continues discussion.)

First-grade students apply their understanding of groups of ten as stated in 1.NOF.C.5a to decade numbers (e.g., 10, 20, 30, 40). As they work with groupable objects, first-grade students understand that 10, 20, 30…80, 90 are comprised of a certain amount of groups of tens with none left over.

Teacher Notes:
Proportional materials: base-ten blocks (large cubes, flats, rods, small cubes) are an efficient and valuable model, as they are proportional in size. For example, the rod is ten times as big as the small cube, and the flat is ten times as big as the rod and one hundred times as big as the small cube. The large cube is a thousand times bigger than the small cube, etc. This helps with developing number sense, as a number like 100 is ten times bigger than ten.
Non-proportional materials: Money is an example of non-proportional materials. The size of a coin does not reflect its value, e.g., a dime is smaller than a penny; however, a dime is worth ten times more.

Base-Ten Materials: Groupable and Pre-Grouped
Ample experiences with a variety of groupable materials that are proportional (e.g., cubes, links, beans, beads, sticks, straws) and ten frames allow students opportunities to create tens and break apart tens, rather than "trade" one for another. Since students' first learning about place value concepts primarily relies on counting, the physical opportunity to build tens helps them to "see" that a "ten stick" has "ten items" within it. Pre-grouped materials (e.g., base ten blocks, bean sticks) are not introduced or used until a student has a firm understanding of composing and decomposing tens. (Van de Walle & Lovin, 2006)

Algebraic Reasoning

A. Represent and solve problems involving addition and subtraction. In this cluster, the terms students should learn to use with increasing precision are **add, adding to, taking from, putting together, taking apart, comparing, unknown, total, less than, equal to, minus, subtract, the same amount as, and (to describe (+) symbol), counting on, making ten, doubles, and equation.**

Notes on vocabulary:

1. While some standards use the term "sum," the term "total" is used in the student examples. "Sum" sounds the same as "some," but has the opposite meaning. "Some" is used to describe problem situations with one or both addends unknown, so it is better in the earlier grades to use "total" rather than "sum." Formal vocabulary for subtraction ("minuend" and "subtrahend") is not needed for kindergarten, grade 1, and grade 2, and may inhibit students from seeing and discussing relationships between addition and subtraction. At these grades, the recommendation is to use the terms "total" and "addend" as they are sufficient for classroom discussion. Note that this recommendation does not prohibit students from learning the term "sum" in grade 1; however, teachers will need to be aware of the misconceptions that its use may create.

2. Subtraction names a missing part. Therefore, the minus sign should be read as "minus" or "subtract" but not as "take away." Although "take away" has been a typical way to define subtraction, it is a narrow and incorrect definition. (*Fosnot & Dolk, 2001; Van de Walle & Lovin, 2006)

1.AR.A.1 Use addition and subtraction within 20 to solve real-world mathematical tasks involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.

a. Represent these situations using models and equations, elevating the concrete-representational-abstract instructional framework.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.ARA.2 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** 1.NOF.A.2, 1.AR.C.6	Application
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3		

Examples and Explanations

Contextual problems that are closely connected to students' lives should be used. Table 1* describes the four different addition and subtraction situations and their relationship to the position of the unknown. First-grade students should have experiences with **all** problem situations in Table 1. Students use objects, drawings, and numbers to represent the different situations.

- Example: Abel has 9 apples. He gave 3 to Susan. How many apples does Abel have now? (A student will start with 9 objects and then remove 3.)
- Compare example: Abel has 9 apples. Susan has 3 apples. How many more apples does Abel have than Susan? (A student will use 9 objects to represent Abel's 9 apples and 3 objects to represent Susan's 3 apples. Then they will compare the 2 sets of objects.)

Note that even though the modeling of the two problems above is different, the equation, 9 - 3 = ?, can represent both situations, yet the compare example can also be represented by 3 + ? = 9 (How many more do I need to make 9?). Students who understand this relationship have mastered 1.AR.B.4.

It is important to attend to the difficulty level of the problem situations in relation to the position of the unknown.

- Result Unknown, Total Unknown, and Both Addends Unknown problems are the least complex for students.
- The next level of difficulty includes Change Unknown, Addend Unknown, and Difference Unknown.

- The most difficult are Start Unknown and versions of Bigger and Smaller Unknown (compare problems).

1.AR.A.2 Solve real-world mathematical tasks that call for addition of three whole numbers whose sum is less than or equal to 20.

a. Represent these situations using models and equations, elevating the concrete-representational-abstract instructional framework.

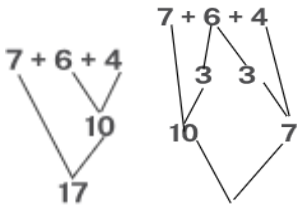
Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** 1.AR.A.1 **1st Grade Standard Taught Concurrently:** none	Application
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3		

Examples and Explanations

Students solve real-world mathematical tasks using properties of operations and counting strategies to find the sum of three whole numbers:

Anna went to the store and bought 7 apples, 6 bananas, and 4 peaches. How many total pieces of fruit did Anna buy?



- Making tens (e.g., 7 + 6 + 4 = 4 + 6 + 7 = 10 + 7 = 17)
- Using doubles and near doubles (doubles plus 1, minus 1)
  e.g., 7 + 6 + 4; student thinks 7 + 6 = 6 + 6 + 1 = 12 + 1 =13; 13 + 4 = 17
- Decomposing numbers between 10 and 20 into tens and ones helps reinforce place value understanding
- Counting on and counting on again (e.g., to add 7 + 6 + 4, a student writes 7 + 6 + 4 = ? and thinks, "8, 9, 10, 11, 12, 13, that's 6 more, 14, 15, 16, 17, that's 4 more, so 7 + 6 + 4 = 17.

B. Understand and apply properties of operations and the relationship between addition and subtraction. In this cluster, the terms students should learn to use with increasing precision are **add, subtract, unknown addend, order, first, second.**

1.AR.B.3 Apply properties of operations to add and subtract.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** 1.AR.B.4	Conceptual Understanding
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3		

Examples and Explanations

Students should understand the important ideas of the following properties:

- Identity property of addition (e.g., 6 = 6 + 0)
- Identity property of subtraction (e.g., 9 – 0 = 9)
- Commutative property of addition (e.g., 4 + 5 = 5 + 4)
- Associative property of addition (e.g., 3 + 9 + 1 = 3 + 10)

Students need several experiences investigating whether the commutative property works with subtraction. The intent is not for students to experiment with negative numbers but only to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should recognize that they will be working with numbers later on that will allow them to subtract larger numbers from smaller numbers. However, in first grade, we do not work with negative numbers.

1.AR.B.4 Understand subtraction as an unknown-addend problem.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** 1.AR.B.3	Conceptual Understanding
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3 4. Given a two-digit number, mentally find 10 more or 10 less.		

Examples and Explanations

When determining the answer to a subtraction problem, 12 – 5, students should think, "If I have 5, how many more do I need to make 12?" Encouraging students to record this symbolically, 5 + ? = 12, will develop their understanding of the relationship between addition and subtraction. Some strategies they may use are counting objects, creating drawings, counting up, using number lines or 10 frames to determine an answer. The meaning of subtraction as an unknown-addend addition problem is one of the essential understandings middle school students will need in order to extend arithmetic to negative rational numbers.

Continued work with Table 1 problems (found at the end of this document) will help develop these understandings.

C. Work with addition and subtraction equations. In this cluster, the terms students should learn to use with increasing precision are **equations, equal, the same amount/quantity as, true, false, addition, putting together, adding to, counting on, making ten, subtract, taking apart, taking from, and unknown.**

1.AR.C.5 Interpret the meaning of the equal sign.

a. Understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s).
b. Determine if equations involving addition and subtraction are true or false.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3		

Examples and Explanations

To determine whether an equation is true or false, grade 1 students must first understand the meaning of the equal sign. This is developed as students in Kindergarten and First Grade solve numerous joining and separating situations with mathematical tools, rather than symbols. Once the concepts of joining, separating, and "the same amount as" are developed concretely, grade 1 students are ready to connect these experiences to the corresponding symbols (+, -, =). Thus, students learn that the equal sign does not mean "the answer comes next", but that the symbol signifies an equivalent relationship, that the left side has the same value as the right side of the equation.

When students understand that an equation needs to "balance," with equal quantities on both sides of the equal sign, they understand various representations of equations, such as:

- an operation on the left side of the equal sign and the answer on the right side (5 + 8 = 13)
- an operation on the right side of the equal sign and the answer on the left side (13 = 5 + 8)
- numbers on both sides of the equal sign (6 = 6)
- operations on both sides of the equal sign (5 + 2 = 4 + 3).

Once students understand the meaning of the equal sign, they are able to determine if an equation is true (9 = 9) or false (9 = 8). These key skills are hierarchical in nature and need to be developed over time. Experiences determining if equations are true or false help students develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for

students to reason at a more abstract level. At all times, students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you get the original number that you started with), and make estimations. Examples of true and false statements:

- $7 = 8 - 1$
- $8 = 8$
- $1 + 1 + 3 = 7$
- $4 + 3 = 3 + 4$

- $6 - 1 = 1 - 6$
- $12 + 2 - 2 = 12$
- $9 + 3 = 10$
- $5 + 3 = 10 - 2$
- $3 + 4 + 5 = 3 + 5 + 4$

- $3 + 4 + 5 = 7 + 5$
- $13 = 10 + 4$
- $10 + 9 + 1 = 19$

1.AR.C.6 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** 1.AR.C.5 **1st Grade Standard Taught Concurrently:** 1.AR.A.1	Conceptual Understanding
Foundational Skills: 1. Fluently add and subtract within 10. 2. Identify equivalent sums and differences of one-digit numbers. Ex. 6 - 2 = 2 + 2 3. Determine the missing number in an equation with numbers less than or equal to 10. Ex. 8 + ? = 10; 5 = ☐ - 3		

Examples and Explanations

Students need to understand the meaning of the equal sign and know that the value on one side of the equal sign must be the same value on the other side of the equal sign. They should be exposed to problems with the unknown in different positions. Having students create real-world mathematical tasks for given equations will help them make sense of the equation and develop strategic thinking.

Examples of possible student "think-throughs":

- 8 + ? = 11: "8 and some number is the same as 11. 8 and 2 is 10, and 1 more makes 11. So the answer is 3."
- 5 = ☐ – 3: "This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I know 5 + 3 = 8, then I know that I started with 8 cookies if I ate 3 and had 5 left."

D. Compare numbers. In this cluster, the terms students should learn to use with increasing precision are **tens, ones, bundle, left-overs, singles, groups, greater/less than, equal to, compare, digit, number,** and **numeral**.

1.AR.D.7 Compare two, two-digit numbers based on values of the tens and ones digits, recording the results of comparisons with comparative language or the symbols >, =, < and the words *greater than, equal to* and *less than.*

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.NOF.C.6 **1st Grade Standard Taught in Advance:** 1.NOF.C.5 **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 7. Compare numbers up to 100, identifying whether one number is greater than, less than, or equal to another.		

Examples and Explanations

Students use models that represent two sets of numbers. To compare, students first attend to the number of tens, then, if necessary, to the number of ones. Students may also use pictures and spoken or written words to compare two numbers. After numerous experiences verbally comparing two sets of objects using comparison vocabulary (e.g., 42 is more than 31, 23 is less than 52, 61 is the same amount as 61), first-grade students connect the vocabulary to the symbols: greater than (>), less than (<), equal to (=).

Example: Compare these two numbers. 42 _ _ 45

Student A
42 has 4 tens and 2 ones. 45 has 4 tens and 5 ones. They have the same number of tens, but 45 has more ones than 42. So, 42 is less than 45.

42 < 45

Student B
42 is less than 45. I know this because when I count up 1 say 42 before I say 45.

42 < 45

This says 42 is less than 45.

E. Use place value understanding and properties of operations to add and subtract. In this cluster, the terms students should learn to use with increasing precision are **ones, tens, add, subtract, reason, more,** and **less**.

1.AR.E.8 Add one and two digit numbers within the range of 0-99, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10.

a. Use concrete models or drawings and strategies based on place value, properties of operations, and the part:whole relationship between addition and subtraction to add and subtract; relate the strategy to a number sentence.
b. Understand that in adding two-digit numbers, one must add tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
c. Justify the reasoning of methods for addition used with an oral or written explanation.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** 1.NOF.A.2, 1.NOF.C.5 **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding (4a,4b), Procedural Skill and Fluency (4)

Examples and Explanations

This standard does **not** limit the addition of two-digit numbers to a two-digit number and a multiple of 10 because the term "including" does not exclude adding two-digit numbers, such as 19 + 18. In grade 2, students are required to add up to four two-digit numbers (2.NOF.C.7) using place value strategies and properties of operation. Thus, this standard serves as the foundation for the grade 2 standard. The only restriction is that the sum of the two numbers must be 100 or less. Intensive work with adding a two-digit number to a multiple of 10 and adding a two-digit number to a one-digit number will enhance students' understanding of adding digits with the same place value.

Students extend their number facts and place value strategies to add within 100. They represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. It is important for students to understand that if they are adding a number that has 10s to a number with 10s, they will have more tens than they started with; the same applies to the ones. Also, students should be able to apply their place value skills to decompose numbers. For example, 17 + 12 can be thought of as 1 ten and 7 ones plus 1 ten and 2 ones.

Students should be exposed to problems both in and out of context and presented in horizontal and vertical forms. As students are solving problems, it is important that they use language associated with proper place value (see example). They should always explain and justify their mathematical thinking both verbally and in a written format. Estimating the solution prior to finding the answer focuses students on

the meaning of the operation and helps them attend to the actual values. This standard focuses on developing addition — the intent is not to introduce traditional algorithms or rules.

Examples:

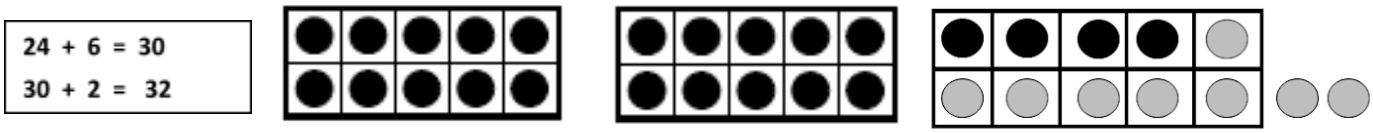
- 43 + 30
  Student counts up by 10 from 43: 43, 53, 63, 73.

- 28 + 34
  Student thinks: 2 tens plus 3 tens is 5 tens or 50. S/he counts the ones and notices there is another 10 plus 2 more. 50 and 10 is 60 plus 2 more or 62.

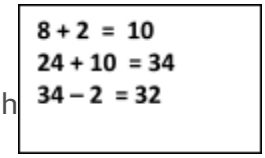
- 29 + 14
  Student thinks: 29 is almost 30. I added one to 29 to get to 30. 30 and 14 is 44. Since I added one to 29, I have to subtract one, so the answer is 43.

Example: Explain how to add 24 and 8. Show your work.

Student A:
I used ten frames. I put 24 chips on 3 ten frames. Then, I counted out 8 more chips. 6 of them filled up the third ten-frame. That meant I had 2 left over. 3 tens and 2 left over. That's 32. So, 24 + 8 = 32.



Student B:
I turned 8 into 10 by adding 2 because it's easier to add.
So, 24 and ten more is 34. But, since I added 2 extra, I had to take th
34 minus 2 is 32.



Example: Use the hundreds chart to add 63 and 20. Explain your strategy.

Student Response:
I started at 63 and jumped down one row to 73. That means I moved 10 spaces. Then, I jumped down one more row (that's another 10 spaces) and landed on 83. So, 63 + 20 = 83.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1.AR.E.9 Subtract two-digit numbers, limited to multiples of 10, 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. Justify the reasoning used when choosing the model or strategy to compute with an oral and/or written explanation.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** 1.NOF.C.5 **1st Grade Standard Taught Concurrently:** 1.NOF.A.3	Conceptual Understanding
Foundational Skills: 1. Fluently add and subtract within 10. 4. Given a two-digit number, mentally find 10 more or 10 less.		

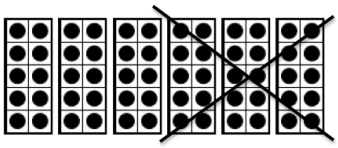
Examples and Explanations

This standard is foundational for future work in subtraction with more complex numbers. Students should have multiple experiences representing numbers that are multiples of 10 (e.g., 90) with models or drawings. Then they subtract multiples of 10 (e.g., 20) using these representations or strategies based on place value. These opportunities develop fluency with addition and subtraction and reinforce counting up and back by 10s.

Example: Explain how to find 60 - 30.

Sample response

I used ten frames. I had 6 ten frames — that's 60. I removed three ten frames because 30 students left the gym. There are 30 students left in the gym.



60 - 30 = 30

Examples with explanations and no models:

- 70 – 30: Seven 10s take away three 10s is four 10s or 40.
- 80 – 50: 80, 70 (subtract one 10), 60 (subtract two 10s), 50 (subtract three 10s), 40 (subtract four 10s), 30 (subtract five 10s), so 80 – 50 = 30

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 **shape, closed, open, side, attribute1, feature1, two-dimensional, rectangle, square, rhombus, trapezoid, triangle, half-circle, and quarter-circle, three-dimensional, cube, cone, prism, cylinder, partition, equal shares, halves, fourths, quarters, half of, fourth of, and quarter of.1 "Attributes" and "features" are used interchangeably to indicate any characteristic of a shape, including properties, and other defining characteristics (e.g., straight sides) and non-defining characteristics (e.g., "right-side up").**

1.GL.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size).

a. Build and draw shapes that possess defining attributes.
b. Verbally describe why a shape belongs to a given category.

Standard Overview

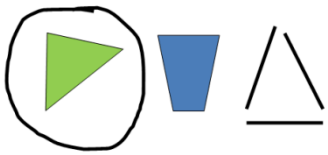
Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** K.GL.A.2, K.GL.A.3, K.GL.B.4 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

First-grade students use their beginning knowledge of defining and non-defining attributes of two-dimensional shapes to identify, name, build and draw shapes (including triangles, squares, rectangles, and trapezoids). They understand that defining attributes are always-present features that classify a particular object (e.g., number of sides, angles, etc.). They also understand that non-defining attributes are features that may be present, but do not identify what the shape is called (e.g., color, size, orientation, etc.).

Example:
All triangles must be closed figures and have 3 sides. These are defining attributes.
Triangles can be different colors, sizes, and be turned in different directions. These are non-defining attributes.

Student
I know that this shape is a triangle because it has 3 sides.
It's also closed, not open.



Student
I used toothpicks to build a square. I know it's a square because it has 4 sides. And, all 4 sides are the same size.

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.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** K.GL.B.6 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

As first graders create composite (a figure made up of two or more geometric shapes) two- and three-dimensional shapes, they begin to see how shapes fit together to create different shapes. Through this learning, students begin developing an understanding of part-to-whole relationships, recognizing how smaller shapes combine to form a larger whole and how a whole can be decomposed into parts. They also begin to notice shapes within an already existing shape. They may use such tools as pattern blocks, tangrams, attribute blocks, or virtual shapes to compose different shapes.
First-grade students are not required to know formal names for right rectangular prism, right circular cone, and right circular cylinders. They should recognize a tissue box or a cube as a prism, a soup can as a cylinder, and an ice cream cone (pointed end) as a cone.

Example: What shapes can you create with triangles?

Student A: I made a square. I used 2 triangles.
Student B: I made a trapezoid. I used 4 triangles.
Student C: I made a tall skinny rectangle. I used 6 triangles.

First graders learn to perceive a combination of shapes as a single new shape (e.g., recognizing that two (isosceles) triangles can be combined to make a rhombus, and simultaneously seeing the rhombus and the two triangles). Note: The term isosceles is not required in grade 1; however, isosceles triangles are found in pattern blocks, and students will likely use two such triangles to form a rhombus.

Thus, they develop competencies that include:

1. Solving shape puzzles
2. Constructing designs with shapes
3. Creating and maintaining a shape as a unit

As students combine shapes, they continue to develop their sophistication in describing geometric attributes and properties and determining how shapes are alike and different, building foundations for measurement and initial understandings of properties such as congruence and symmetry.

Students can make three-dimensional shapes with clay or dough, slice into two pieces (not necessarily congruent), and describe the two resulting shapes. For example, slicing a cylinder will result in two smaller cylinders.

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.

Standard Overview

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

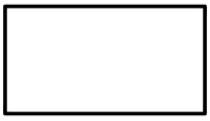
Examples and Explanations

Students need experiences with different-sized circles and rectangles to recognize that when they cut something into two equal pieces, each piece will equal one-half of its original whole. Students should recognize that there are different ways to find halves of the same figure. They should reason that decomposing equal shares into more equal shares results in smaller equal shares. Additionally, students should be given the opportunity to identify examples and non-examples of halves and fourths.

Examples:

- Student partitions a rectangular candy bar to share equally with one friend and thinks, "I cut the rectangle into two equal parts. When I put the two parts back together, they equal the whole candy bar. One-half of the candy bar is smaller than the whole candy bar."

- How can you and a friend share equally (partition) this piece of paper so that you both have the same amount of paper to paint a picture?



Student 1: I would match the short sides of the paper and fold down the middle. That gives us 2 halves. I have half of the paper and my friend has the other half of the paper.

Student 2: I would split it from corner to corner (diagonally). They will get half of the paper and I get half of the other paper. See, if we cut on the line, the parts are the same size.

Data Analysis and Measurement

A. Measure lengths indirectly and by iterating length units. In this cluster, the terms students should learn to use with increasing precision are **measure, order, length, width, height, more, less, longer than, shorter than, first, second, third, gap, overlap, about, a little less than, a little more than, taller, and higher.**

1.DM.A.1 Apply knowledge of "longer than" and "shorter than."

a. Order three objects by length.
b. Compare the lengths of two objects indirectly by using a third object.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** K.DM.A.2 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency

Examples and Explanations

In order for students to be able to compare objects, they need to understand that length is measured from one endpoint to another endpoint. They determine which of two objects is longer by physically aligning the objects. Typical language of length includes taller, shorter, longer, and higher. When students use bigger or smaller as a comparison, they should explain what they mean by the word. Some objects may have more than one measurement of length, so students identify the length they are measuring. Both the length and the width of an object are measurements of length.

Examples for ordering:

- Order three students by their height
- Order pencils, crayons, and/or markers by length
- Build three towers (with cubes) and order them from shortest to tallest
- Three students each draw one line, then order the lines from longest to shortest

Example for comparing indirectly:

- Two students each make a dough "snake." Given a tower of cubes, each student compares his/her snake to the tower. Then students make statements such as "My snake is longer than the cube tower, and your snake is shorter than the cube tower. So, my snake is longer than your snake."

1.DM.A.2 Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end.

a. Understand that the length measurement of an object is the number of same-size length units that span the distance with no gaps or overlaps.

Standard Overview

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

Examples and Explanations

First-graders use objects to measure items to help students focus on the attribute being measured. Measuring objects in this way also lends itself to future discussions regarding the need for a standard unit.

First-grade students use multiple copies of one object (tiles, unifix cubes, paper clips, etc) to measure the length of a larger object. They learn to lay physical units such as centimeter or inch manipulatives end-to-end and count them to measure a length. Through numerous experiences and careful questioning by the teacher, students will recognize the importance of careful measuring so that there are not any gaps or overlaps in order to get an accurate measurement. This concept is a foundational building block for the concept of area in third grade.

Note: While objects used to measure a length may include centimeter or inch manipulatives, students are not introduced to those terms or to a ruler in first grade. The focus should be on giving lengths in terms of the number of objects used (e.g., tiles, cubes, etc.). Students should not be required to measure in centimeters or inches.

Example: How many paper clips long is the pencil?

Student Response: The pencil is about 6 paper clips long.

B. Tell and write time. In this cluster, the terms students should learn to use with increasing precision are **time, hour, half-hour, about, o'clock, past, "six"-thirty, analog clock, and digital clock.**

1.DM.B.3 Tell, write, and represent time in hours and half-hours using analog and digital clocks.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Previous Grade(s) Standard:** none **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency

Examples and Explanations

Ideas to support telling time:

- within a day, the hour hand goes around a clock twice (the hand moves only in one direction)
- when the hour hand points exactly to a number, the time is exactly on the hour
- time on the hour is written in the same manner as it appears on a digital clock
- the hour hand moves as time passes, so when it is halfway between two numbers, it is at the half hour
- there are 60 minutes in one hour; so halfway between an hour, 30 minutes have passed
- half hour is written with "30" after the colon

"It is 4 o'clock"

"It is halfway between 8 o'clock and 9 o'clock. It is eight-thirty."

The idea of 30 being "halfway" is difficult for students to grasp. To help students understand this concept, have students write the numbers from 0 through 60, counting by tens, on a sentence strip. Fold the paper in half and determine that halfway between 0 and 60 is 30.

C. Represent and interpret data. In this cluster, the terms students should learn to use with increasing precision are **data, more, most, less, least, same, different, category, question, collect.**

1.DM.C.4 Use tally marks, t-charts, and tables with up to three categories to:

a. Create bar graphs and picture graphs to represent data precisely with accurate scaling within a scale of 1 or 2.
b. Interpret data represented in a chart or graph by asking and answering questions about:
   - the total number of data points;
   - how many in each category; and
   - how many more or less are in one category than in another?

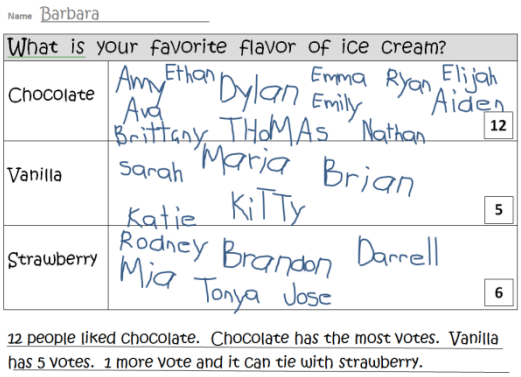
Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** K.DM.B.3 **1st Grade Standard Taught in Advance:** 1.AR.A.1, 1.AR.A.2 **1st Grade Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency, Application
Foundational Skills: 1. Fluently add and subtract within 10. 6. Read and write numbers through 120. 7. Compare numbers up to 100, identifying whether one number is *greater than, less than,* or *equal to* another.		

Examples and Explanations

First-grade students collect and use categorical data (e.g., eye color, shoe size, age) to answer a question. The data collected are often organized in a chart or table. Once the data are collected, first graders interpret the data to determine the answer to the question posed. They also describe the data, noting particular aspects such as the total number of answers, which category had the most/least responses, and interesting differences/similarities between the categories. As the teacher provides numerous opportunities for students to create questions, determine up to 3 categories of possible responses, collect data, organize data, and interpret the results, first graders build a solid foundation for future data representations (picture and bar graphs) in second grade.

Example: Survey Station
During Literacy Block, a group of students work at the Survey Station. Each student writes a question, creates up to 3 possible answers, and walks around the room collecting data from classmates. Each student then interprets the data and writes 2 to 4



sentences describing the results. When all of the students in the Survey Station have completed their own data collection, they each share with one another what they discovered. They ask clarifying questions of one another regarding the data and make revisions as needed. They later share their results with the whole class.

Student: The question "What is your favorite flavor of ice cream?" is posed and recorded. The categories chocolate, vanilla, and strawberry are determined as anticipated responses and written down on the recording sheet. When asking each classmate about their favorite flavor, the student's name is written in the appropriate category. Once the data are collected, the student counts up the amounts for each category and records the amount. The student then analyzes the data by carefully looking at the data and writes four sentences about the data.

D. Work with money. In this cluster, the terms students should learn to use with increasing precision are **penny, nickel, dime, quarter, value, and cents.**

1.DM.D.5 Determine the value of a collection of coins up to 50 cents including pennies, nickels, dimes, and quarters in isolation; not to include a combination of different coins.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Previous Grade(s) Standard:** K.DM.C.4 **1st Grade Standard Taught in Advance:** none **1st Grade Standard Taught Concurrently:** none	Procedural Skill and Fluency
Foundational Skills: 1. Fluently add and subtract within 10. 5. Count to 120 by 5's. 6. Read and write numbers through 120.		

Examples and Explanations

First-grade students extend their knowledge of coin names and values to determine the value of a set of pennies, nickels, dimes, or quarters whose total value is no greater than 50 cents. For pennies, nickels, and dimes, students can skip-count to determine the total value. Since the limit is 50 cents, the number of quarters is limited to two. It is important to recognize that first-grade students do not have an understanding of decimal place values; therefore, requiring students to use decimals is prohibited.

Example: Provide students with a set containing 7 nickels. Students can skip-count by 5s to find that the value is 35 cents.

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

Kindergarten Standards

K.NOF.A.1 Count forward to 100 by ones and tens (i.e., multiples of 10s-30,40,50, etc), beginning with any given number.

a. Count forward to 10 and backward from 10 by ones.
b. Count forward to 20 and backward from 20 by ones. *Return to* 1.NOF.B.4

K.NOF.C.5 Compare sets of objects up to at least 20 in each set using comparative language, e.g., by using matching and counting strategies. *Return to* 1.AR.D.5.7

K.NOF.C.6 Use comparative language to describe numbers up to 20 presented as written numerals. *Return to* 1.AR.A.1, 1.NOF.A.2

K.AR.A.2 Add and subtract within 10, e.g., by using objects or drawings to represent the problem.

a. Solve addition and subtraction real-world mathematical tasks and explain the strategies used with spoken words, models, and/or equations. *Return to* 1.AR.D.7

K.AR.A.3 Decompose numbers less than or equal to 10 (identified as the whole) into parts in more than one way to demonstrate the part: whole relationship. Record each decomposition with a drawing or equation. *Return to* 1.NOF.A.2

K.AR.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using spoken words, objects, models, and/or equations. *Return to* 1.NOF.A.2

K.NOF.D.7 Fluently add and subtract within 5, varying placement of the equal sign, while also ensuring accurate reading of the equation from left to right. For example

- 5 = 2 + 3 (five equals two plus three)
- 2 + 2 = 4 (two plus two is equal to four)
- 3 = 3 - 0 (three is equal to three minus zero)
- 4 - 1 = 3 (four minus one equals three) *Return to* 1.NOF.A.2

K.NOF.E.8 Gain understanding of place value.

a. Understand that the numbers 11–19 are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
b. Compose and decompose numbers 11 to 19 using place value (e.g., by using objects or drawings).
c. Record each composition or decomposition using a drawing or equation (e.g., 18 is one ten and eight ones, 18 = 1 ten + 8 ones, 18 = 10 + 8).

Return to 1.NOF.C.5

K.DM.A.2 Directly compare two objects with a measurable attribute in common, to describe the difference (more of, less of, etc.). *Return to* 1.DM.A.1

K.DM.B.3 Classify objects into two given categories based on their attributes, limiting category counts to less than or equal to 20.

- Count numbers of objects in each category.
- Order the categories by count.

Return to 1.DM.C.4

K.DM.C.4 Identify pennies, nickels, dimes, and quarters by name and value.

- Identify fair-trade values within a dime.
  - 10 pennies = 1 dime
  - 2 nickels = 1 dime
  - 5 pennies = 1 nickel

Return to 1.DM.D.5

K.GL.A.2 Correctly name shapes regardless of their orientations or overall size. Identify examples and nonexamples of those shapes. *Return to* 1.GL.A.1

K.GL.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). Identify faces of three-dimensional shapes as two-dimensional geometric figures. *Return to* 1.GL.A.1

K.GL.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length). *Return to* 1.GL.A.1

K.GL.B.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*
Return to 1.GL.A.2

Table 1: Common addition and subtraction situations[1]

	Result Unknown	Change Unknown	Start Unknown
Add To	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take From	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3
	Total Unknown	**Addend Unknown**	**Both Addends Unknown**
Put Together/Take Apart	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red, and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can be put in a red vase and how many a blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2
	Difference Unknown	**Bigger Unknown**	**Smaller Unknown**
Compare	(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?	(Version with “more”): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have?

	(“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]Adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp. 32, 33).
[2]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in, but always does mean is the same number as.
[3]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[4]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.