Standards Resource Guide

Kindergarten

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.

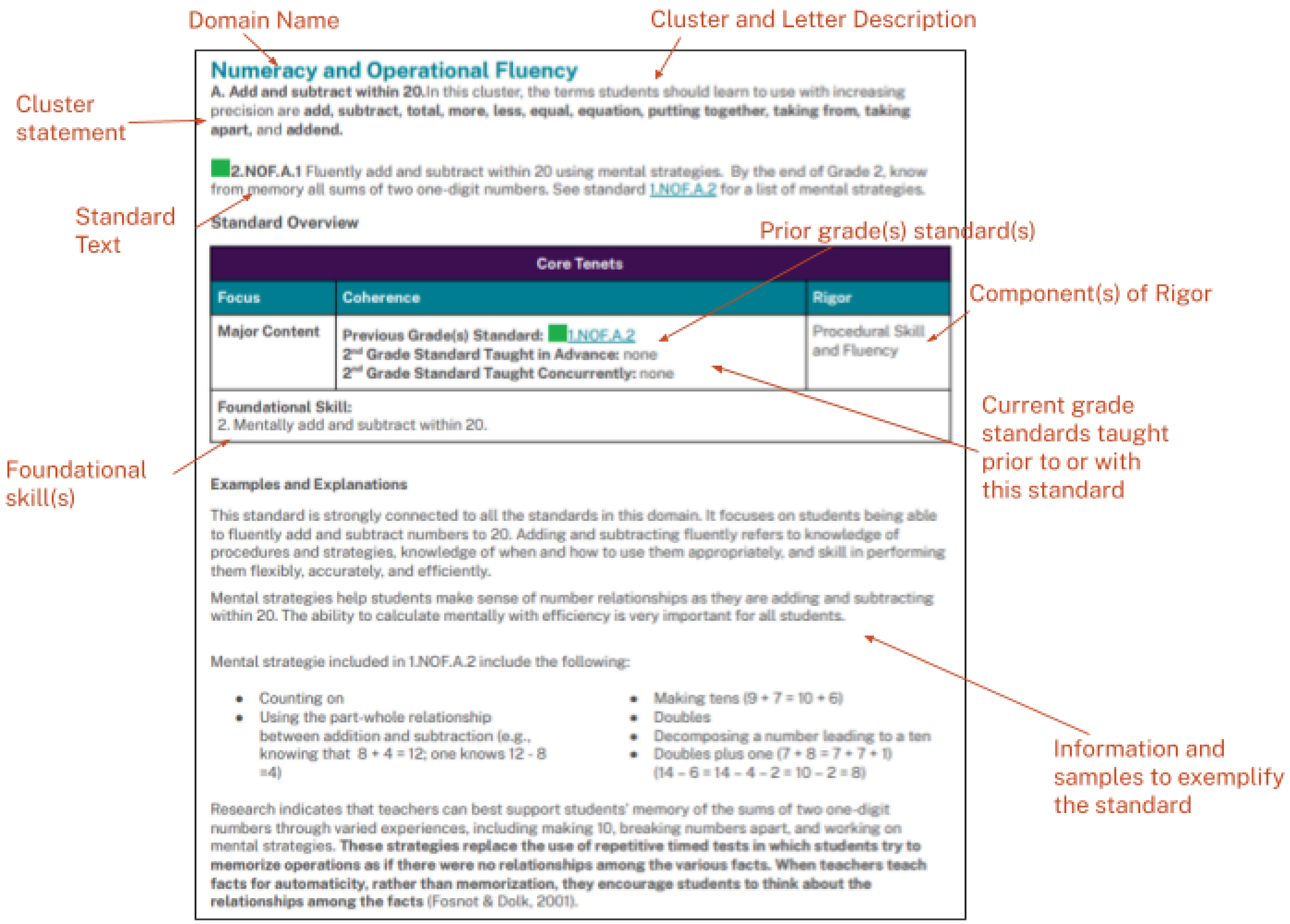
August 2026

Table of Contents

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.

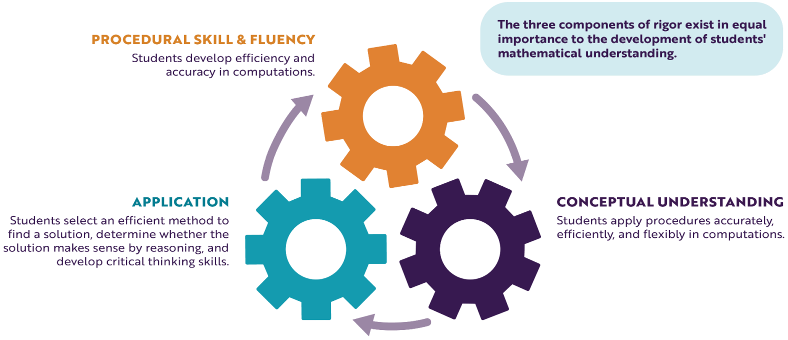
Classification of Major, Supporting, and Additional Work

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 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.

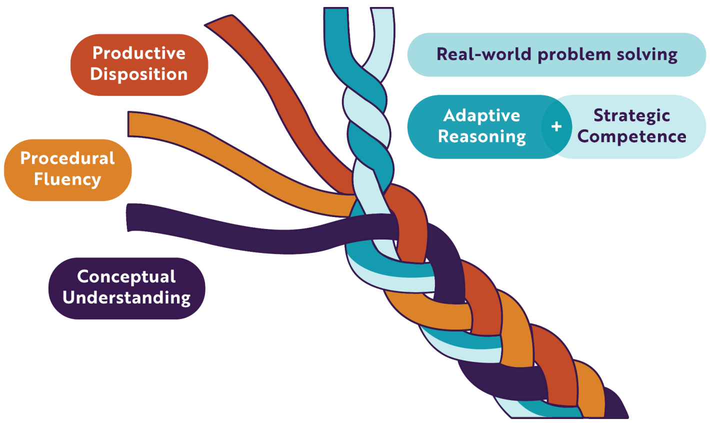
Focus calls for intentional emphasis on specific topics, skills, and ideas within grade-level mathematics instruction. Not all content in a given grade is emphasized equally in the standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to 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 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.

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[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 (K.AR.A.4)	**Real-World Mathematical Task** (K.AR.A.4)
A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing?	A full case of juice boxes holds 10 juice boxes. A case is not full. How many juice boxes might be in the case? How many are missing? Explain your thinking.

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 Kindergarten complete.

Louisiana Standards for Mathematical Practice (MP)	
Louisiana Standard	**Explanations and Examples**
K.MP.1 Make sense of problems and persevere in solving them.	In kindergarten, students begin to build the understanding 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?" or they may try another strategy.
K.MP.2 Reason abstractly and quantitatively.	Younger students begin to recognize that a number represents a specific quantity. Then, they connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities.
K.MP.3 Construct viable arguments and critique the reasoning of others.	Younger students construct arguments using concrete referents, such as objects, pictures, drawings, and actions. They also begin to develop 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 to others and respond to others' thinking.
K.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.
K.MP.5 Use appropriate tools strategically.	Younger students begin to consider the available tools (including estimation) when solving a math problem and decide when certain tools might be helpful. For instance, students may decide that it might be advantageous to use linking cubes to represent two quantities and then compare the two representations side by side.
K.MP.6 Attend to precision.	As students begin to develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their reasoning.
K.MP.7 Look for and make use of structure.	Younger students begin to discern a pattern or structure. For instance, students recognize the pattern that exists in the teen numbers; every teen number is written with a 1 (representing one ten) and ends with the digit that is first stated. They also recognize that $3 + 2 = 5$ and $2 + 3 = 5$.
K.MP.8 Look for and express regularity in repeated reasoning.	In the early grades, students notice repetitive actions in counting and computation, etc. For example, they may notice that the next number in a counting sequence is one more. When counting by tens, the next number in the sequence is "ten more" (or one more group of ten). In addition, students continually check their work by asking themselves, "Does this make sense?"

Grade Level Expected Foundational Skills

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

1. Count to 100 by tens and ones.
2. Read and write numbers 0-20.
3. Count out 0-20 objects and count groups of objects up to 20.
4. Count to answer "How many?"
5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity.
6. Compare two numbers between 1 and 20 to identify which is greater or less.
7. Fluently add and subtract within five.

Numeracy and Operational Fluency

A. Know number names and the count sequence. In this cluster, the terms students should learn to use with increasing precision are **Introduce written number words zero, one, two...ten (students are not responsible for being able to read these words, but they should be introduced); know digits and orally count to one hundred.**

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.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Procedural Skill and Fluency
Foundational Skills: 1. Count to 100 by tens and ones.		

Examples and Explanations

Students engage in rote counting by starting at one and counting to 100. They also engage in counting forward to 10 and backwards from 10 by ones, as well as counting forward to 20 and backward from 20 by ones. When counting by ones, students need to understand that the next number in the sequence is one more. When students count by tens, they are only expected to master counting on the decade (0, 10, 20, 30, 40,...). When counting by tens, students need to understand that the next number in the sequence is "ten more" (or one more group of ten). Counting in this standard is focused solely on rote counting and is not tied to recognition of numerals. Use of numerals requires that students have an understanding of the number of objects that the numeral represents so that comparisons can be made. Such understandings are developed in K.NOF.B.3 and K.NOF.B.4.

K.NOF.A.2 Read, write, and represent whole numbers from 0 to 20 with a written numeral, objects, or pictures.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 1. Count out 0-20 objects and count groups of objects up to 20. 2. Read and write numbers 0-20.		

Examples and Explanations

Students write the numerals 0 through 20 and use the written numerals 0 through 20 to represent the amount within a set. For example, if the student has counted 9 objects, then the written numeral “9” is recorded. Students can record the quantity of a set by selecting a number card/tile (numeral recognition) or writing the numeral. Students can also create a set of objects based on the numeral presented. For example, if a student picks up the number card “13,” the student then creates a pile of 13 counters. While children may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0 through 20.

Due to varied development of fine motor and visual development, reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself.

B. Count to tell the number of objects. In this cluster, the terms students should learn to use with increasing precision are number words (zero - one hundred), how many, and count on.

K.NOF.B.3 Understand the relationship between numbers and quantities; connect counting to cardinality, with cardinality referring to the number that connects the final count number to its quantity of an entire set.

a. When counting objects in standard order, say the number names as they relate to each object in the group, demonstrating one-to-one correspondence.
b. Understand that the last number name said tells the number of objects counted (cardinality). The number of objects is the same regardless of their arrangement or the order in which they were counted.
c. Understand that each successive number name refers to a quantity that is one larger, which may include the use of objects or visual representations.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** K.NOF.A.1, K.NOF.B.4	Conceptual Understanding (3, 3a, 3b, 3c)
Foundational Skills: 1. Count to 100 by tens and ones. 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?"		

Examples and Explanations

This standard is tightly linked to K.NOF.B.4. Students count a set of objects and see sets and numerals in relationship to one another. These connections are higher-level skills that require students to analyze, reason about, and explain relationships between numbers and sets of objects. The expectation is that students are comfortable with these skills with the numbers 1 through 20 by the end of kindergarten.

Students implement correct counting procedures by pointing to one object at a time (one-to-one correspondence), using one counting word for every object (synchrony/ one-to-one tagging), while keeping track of objects that have and have not been counted. This is the foundation of counting.

Students answer the question "How many are there?" by counting objects in a set and understanding that the last number stated when counting a set (...8, 9, 10) represents the total number of objects: "There are 10 bears in this pile" (cardinality). Since an important goal for children is to count with meaning, it is important to have children answer the question "How many do you have?" after they count. Oftentimes, children who have not developed cardinality will count the amount again, not realizing that the 10 they stated means 10 objects in all.

Young children believe what they see. Therefore, they may believe that a pile of cubes that they counted may be more if spread apart in a line. As children move toward the developmental milestone of conservation of number, they develop the understanding that the number of objects does not change when the objects are moved, rearranged, or hidden. Children need many different experiences with counting objects, as well as maturation, before they can reach this developmental milestone.

Another important milestone in counting is inclusion (also known as hierarchical inclusion). Inclusion is based on the understanding that numbers build by exactly one each time and that they nest within each other by this amount. For example, a set of three objects is nested within a set of 4 objects; within this same set of 4 objects is also a set of two objects and a set of one. Using this understanding, if a student has four objects and wants to have 5 objects, the student is able to add one more, knowing that four is within, or a subpart of, 5 (rather than removing all 4 objects and starting over to make a new set of 5). This concept is critical for the later development of part-whole relationships.

K.NOF.B.4 Answer “How many?” questions by subitizing (perceptually and conceptually) and counting.

a. Subitize within 5.
b. Subitize or count objects up to 20, arranged in a line, a rectangular array, or a circle.
c. Subitize or count objects up to 10 in a scattered configuration.
d. When given a number from 1-20, count out that many objects.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** K.NOF.C.5	Conceptual Understanding, Procedural Skill, and Fluency
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer “How many?” 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity.		

Examples and Explanations

In order to answer “how many?” students need to keep track of objects when counting. Keeping track is a method of counting that is used to count each item once and only once when determining how many. After numerous experiences with counting objects, along with the developmental understanding that a group of objects counted multiple times will remain the same amount, students recognize the need for keeping track in order to accurately determine “how many.” In addition, students begin to develop the ability to subitize quantities, recognizing small groups of objects instantly without counting, which supports their overall number sense and counting accuracy. Depending on the amount of objects to be counted and the students’ confidence with counting a set of objects, students may move the objects as they count each, point to each object as counted, look without touching when counting, or use a combination of these strategies. It is important that children develop a strategy that makes sense to them based on the realization that keeping track is important in order to get an accurate count, as opposed to following a rule such as “Line them all up before you count,” in order to get the right answer.

As children learn to count accurately, they may count a set correctly one time, but not another. Other times they may be able to keep track up to a certain amount, but then lose track from then on. Some arrangements, such as a line or rectangular array, are easier for them to get the correct answer but may limit their flexibility with developing meaningful tracking strategies, so providing multiple arrangements helps children learn how to keep track. Since scattered arrangements are the most challenging for students, this standard specifies that students only count up to 10 objects in a scattered arrangement and count up to 20 objects in a line, rectangular array, or circle.

After counting a set of 8 objects, students answer the question “How many would there be if we added one more object?” and answer a similar question when not using objects, by asking hypothetically, “What if we have 5 cubes and added one more? How many cubes would there be then?”

C. Compare numbers. In this cluster, the terms students should learn to use with increasing precision are **greater, more, less, fewer, equal, same amount,** and **compare**.

K.NOF.C.5 Compare sets of objects up to and including 20 in each set using comparative language, e.g., by using matching and counting strategies.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** K.NOF.B.4	Conceptual Understanding
Foundational Skills: 2. Read and write numbers 0-20. 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity. 6. Compare two numbers between 1 and 20 to identify which is greater or less.		

Examples and Explanations

Students use their counting ability to compare sets of objects (0 through 20). They may use matching strategies (Student 1), counting strategies (Student 2), or equal shares (Student 3) to determine whether one group is greater than, less than, or equal to the number of objects in another group.

K.NOF.C.6 Use comparative language to describe numbers up to 20 presented as written numerals.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.NOF.C.5 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 2. Read and write numbers 0-20. 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity. 6. Compare two numbers between 1 and 20 to identify which is greater or less.		

Examples and Explanations

Students apply their understanding of numerals 1 through 20 to compare one numeral from another. Thus, looking at the numerals 8 and 10, a student is able to recognize that the numeral 10 represents a larger amount than the numeral 8. Students need ample experiences with actual sets of objects (K.NOF.A.2 and K.NOF.C.5) before completing this standard with only numerals.

D. Add and subtract within 5.

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)

Standard Overview

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<tr><th colspan="3">Core Tenets</th></tr>
<tr><th>Focus</th><th>Coherence</th><th>Rigor</th></tr>
<tr><td>Major Content</td><td>Remediation - Previous Grade(s) Standard: none
Kindergarten Standard Taught in Advance: K.AR.A.3
Kindergarten Standard Taught Concurrently: none</td><td>Procedural Skill and Fluency</td></tr>
<tr><td colspan="3">Foundational Skills:
2. Read and write numbers 0-20.
4. Count to answer “How many?”
5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity.
7. Fluently add and subtract within five</td></tr>
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Examples and Explanations

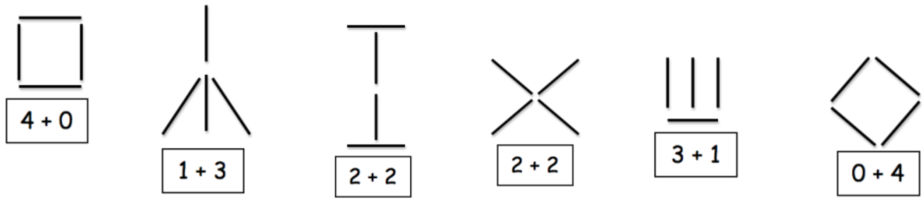
Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3 to 5 seconds without resorting to counting), and flexibility (using various strategies).[2]

Students develop fluency by understanding and internalizing the relationships that exist between and among numbers. Oftentimes, when children think of each “fact” as an individual item that does not relate to any other “fact,” they are attempting to memorize separate bits of information that can be easily forgotten. Instead, in order to fluently add and subtract, children must first be able to see subparts within a number (inclusion, K.NOF.B.3c).

Once they have reached this milestone, children need repeated experiences with many different types of concrete materials (such as cubes, chips, and buttons) over an extended amount of time in order to recognize that there are only particular subparts for each number. Therefore, children will realize that if 3 and 2 is a combination of 5, then 3 and 2 cannot be a combination of 6.

[2] Van de Walle & Lovin (2006). Teaching student centered mathematics K–3 (p.94). Boston: Pearson.

For example, after making various arrangements with toothpicks, students learn that only a certain number of subparts exist within the number 4:



Then, after numerous opportunities to explore, represent, and discuss "4," a student becomes able to fluently answer problems, such as "One bird was on the tree. Three more birds came. How many are on the tree now?" and "There was one bird on the tree. Some more came. There are now 4 birds on the tree. How many birds came?"

Traditional flash cards or timed tests have not been proven as effective instructional strategies for developing fluency.[3] Rather, numerous experiences with breaking apart actual sets of objects and developing relationships between numbers help children internalize parts of numbers and develop efficient strategies for fact retrieval.

During instruction, students should develop an understanding of the meaning and placement of the equal sign in addition and subtraction equations, while also learning to read and interpret the entire equation from left to right.

[3] Burns (2000) *About Teaching Mathematics*; Fosnot & Dolk (2001) *Young Mathematicians at Work;* Richardson (2002) *Assessing Math Concepts*; Van de Walle & Lovin (2006) *Teaching Student-Centered Mathematics*

E. Work with numbers 11-19 to gain foundations for place value. In this cluster, the terms students should learn to use with increasing precision are number words (one, two… thirteen, fourteen, … nineteen), leftovers, and ones.

K.NOF.E.8 Gain an 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 understanding (e.g., by using objects, drawings, or verbal responses identifying tens and ones).
c. Record each composition or decomposition using a drawing or equation. For example: 18 is one ten and eight ones, 18 = 1 ten + 8 ones, 18 = 10 + 8.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.AR.A.3 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill, and Fluency
Foundational Skills: 2. Read and write numbers 0-20. 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?"		

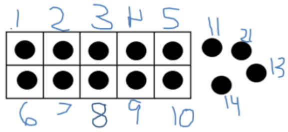
Examples and Explanations

Students explore numbers 11 through 19 using representations, such as manipulatives or drawings. Keeping each count as a single unit, kindergarteners use 10 objects to represent "10" rather than creating a unit called a ten (unitizing) as indicated in the first-grade standard 1.NOF.B.4: 10 can be thought of as a bundle of ten ones — called a "ten."

Example:
Teacher: "I have some chips here. Do you think they will fit on our ten frame? Why? Why Not?"
Students: Share thoughts with one another.
Teacher: "Use your ten frame to investigate."
Students: "Look. There's too many to fit on the ten frame. Only ten chips will fit on it."
Teacher: "So you have some leftovers?"
Students: "Yes. I'll put them over here next to the ten frame."
Teacher: "So, how many do you have in all?"
Student A: "One, two, three, four, five… ten, eleven, twelve, thirteen, fourteen. I have fourteen. Ten fit on and four didn't."
Student B: Pointing to the ten frame, "See them- that's 10… 11, 12, 13, 14. There's fourteen."

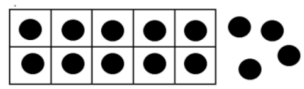
Teacher: Use your recording sheet (or number sentence cards) to show what you found.

Student Recording Sheets Example:



14 is 10 on and 4 off.

ALL	On	Off
14	10	4



14 = 10 + 4

Algebraic Reasoning

A. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. In this cluster, the terms students should learn to use with increasing precision are **join, add, putting together, taking apart, taking from, separate, subtract, and, same amount as, equal, less, more, total,** and **count on.**

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.

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.[4]

[4] Fosnot & Dolk, 2001; Van de Walle & Lovin, 2006

K.AR.A.1 Represent addition and subtraction of two whole numbers from 0 to 10 with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity. 7. Fluently add and subtract within five		

Examples and Explanations

Students demonstrate understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations in various ways. This objective is focused on understanding the concept of addition and subtraction, rather than reading and solving addition and subtraction number sentences (equations).

The Grade Level Overview in the Louisiana Student Standards states, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required." Please note that it is not until first grade when "Understand the meaning of the equal sign" is an expectation (1.AR.C.5).

Therefore, before being introduced to symbols (+, -, =) and equations, kindergarteners require numerous experiences using joining (addition) and separating (subtraction) vocabulary in order to attach meaning to the various symbols. For example, when explaining a solution, kindergarteners may state, "Three and two is the same amount as 5." While the meaning of the equal sign is not introduced as a standard until first grade, if equations are going to be modeled and used in kindergarten, students must connect the symbol (=) with its meaning (is the same amount/quantity as).

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.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.AR.A.1 **Kindergarten Standard Taught Concurrently:** none	Procedural Skill, Fluency, Application
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity. 7. Fluently add and subtract within five		

Examples and Explanations

Kindergarten students solve four types of problems within 10: *Result Unknown/Add To; Result Unknown/Take From; Total Unknown/Put Together-Take Apart; and Both Addends Unknown/Put Together-Take Apart*. (See **Table 1** at the end of the document for examples of all problem types.) Kindergarteners use counting to solve the four problem types by acting out the situation and/or with objects, fingers, and drawings.

Example: Nine grapes were in the bowl. I ate 3 grapes. How many grapes are in the bowl now?

(Possible solution) Student: I got 9 "grapes" and put them in my bowl. Then, I took 3 grapes out of the bowl. I counted the grapes still left in the bowl... 1, 2, 3, 4, 5, 6. Six. There are 6 grapes in the bowl.

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.

a. Record each decomposition with a drawing or equation.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.AR.A.2 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 7. Fluently add and subtract within five		

Examples and Explanations

Students develop an understanding of part-whole relationships as they recognize that a set of objects (5) can be broken into smaller subsets (3 and 2) and still remain the total amount (5). In addition, this objective asks students to realize that a set of objects (5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decomposing), students use the understanding that a smaller set of objects exists within that larger set (inclusion).

Example:

(Provide students with 5 buttons and four copies of a page on which two bears, labeled as Bear 1 and Bear 2, have been drawn.)

Tell students that Bobby has 5 buttons that he wants to sew on 2 stuffed bears. Ask students to draw pictures to show how many ways Bobby can sew the 5 buttons on the two bears.

Solution: Students draw pictures of bears showing the combinations of buttons as 4 and 1, 1 and 4, 2 and 3, and 3 and 2.

In kindergarten, students need ample experience breaking apart numbers and using the vocabulary "and" and "same amount as" before symbols (+, =) and equations (5 = 3 + 2) are introduced. If equations are used, mathematical representations (pictures, objects) need to be present as well.

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.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Major Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.AR.A.3 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 5. Subitize (i.e., instantly recognize without needing to count individually) groups of images or objects to recognize the quantity. 6. Compare two numbers between 1 and 20 to identify which is greater or less. 7. Fluently add and subtract within five		

Examples and Explanations

Students build upon the understanding that a number (less than or equal to 10) can be decomposed into parts (K.AR.A.3) to find a missing part of 10. Through numerous concrete experiences, kindergarteners model the various subparts of ten and find the missing part of 10.

Example:

When working with 2-color beans, a student determines that 4 more beans are needed to make a total of 10.

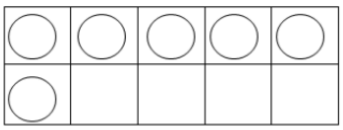
"I have 6 beans. I need 4 more beans to have 10 in all."

In addition, kindergarteners use various materials to solve tasks that involve decomposing and composing 10.

Example:

A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing?

Student A:
Using a Ten-Frame
"I used a ten frame for the case. Then, I put on 6 counters for juice still in the case. There's no juice in these 4 spaces. So, 4 are missing."



Student B:
Think Addition
"I counted out 10 counters because I knew there needed to be ten. I pushed these 6 over here because they were in the container. These are left over. So there's 4 missing."

Student C:
Fluently add/subtract
"I know that it's 4 because 6 and 4 is the same amount as 10."

Geometric Reasoning and Logic

A. Identify and describe shapes (Squares, Circles, Triangles, Rectangles, Hexagons, Cubes, Cones, Cylinders, and Spheres. In this cluster, the terms students should learn to use with increasing precision are squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, spheres, flat, solid, side, corner, edge, face, and positional vocabulary (e.g., above, below, beside, in front of, behind, next to, same, different, etc.).

K.GL.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind, and next to.*

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** K.GL.A.2	Conceptual Understanding

Examples and Explanations

Students locate and identify shapes in their environment. For example, a student may look at the tile pattern arrangement on the hall floor and say, "Look! I see squares! They are next to the triangle." At first, students may use informal names (e.g., balls, boxes, cans). Eventually, students refine their informal language by learning mathematical concepts and vocabulary and identify, compare, and sort shapes based on geometric attributes.

Students also use positional words (such as those italicized in the standard) to describe objects in the environment, developing their spatial reasoning competencies. Kindergarten students need numerous experiences identifying the location and position of actual two- and three-dimensional objects in their classroom/school prior to describing location and position of two- and three-dimensional representations on paper.

K.GL.A.2 Correctly name shapes regardless of their orientations or overall size.

- Identify examples and nonexamples of those shapes.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.GL.A.3, K.GL.B.4 **Kindergarten Standard Taught Concurrently:** K.GL.A.1	Conceptual Understanding, Procedural Skill, and Fluency

Examples and Explanations

Through numerous experiences exploring and discussing shapes, students begin to understand that certain attributes define what a shape is called (number of sides, number of corners, etc.) and that other attributes do not (color, size, orientation). Students also learn to identify examples and nonexamples of shapes based on these defining attributes. As the teacher facilitates discussions about shapes ("Is it still a triangle if I turn it like this?"), children question what they "see" and begin to focus on the geometric attributes.

Kindergarten students typically do not yet recognize triangles that are turned upside down as triangles, since they don't "look like" triangles. Students need ample experience manipulating shapes and looking at shapes with various typical and atypical orientations. Through these experiences, students will begin to move beyond what a shape "looks like" to identifying particular geometric attributes that define a shape.

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.

Standard Overview

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

Examples and Explanations

Students identify objects as flat (two-dimensional) or solid (three-dimensional. Additionally, students can identify the faces of three- dimensional shapes as two-dimensional geometric figures. As the teacher embeds the vocabulary into students' exploration of various shapes, students use the terms two-dimensional and three-dimensional as they discuss the properties of various shapes. Note: A solid does not mean "filled in." A cube that is empty is still called a solid.

B. Analyze, compare, create, and compose shapes. In this cluster, the terms students should learn to use with increasing precision are compare, compose, attributes, sides, vertices/corners, vertex, two-and three-dimensional, same, and different.

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).

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.GL.A.1, K.GL.A.2 **Kindergarten Standard Taught Concurrently:** K.GL.A.3	Conceptual Understanding

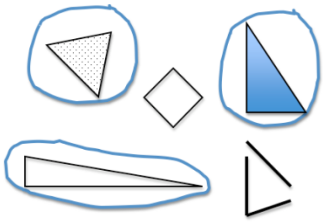
Examples and Explanations

Students relate one shape to another as they note similarities and differences between and among two-dimensional and three-dimensional shapes using informal language.

For example, when comparing a triangle and a square, they note that they both are closed figures, have straight sides, but the triangle has three sides while the square has four. Or, when building in the Block Center, they notice that the faces on the cube are all square shapes.

Kindergarteners also distinguish between the most typical examples of a shape from obvious non-examples.

For example, when identifying the triangles from a collection of shapes, a student circles all of the triangle examples from the non-examples.



K.GL.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

Students apply their understanding of geometric attributes of shapes in order to create given shapes. For example, students may roll a clump of clay-like material into a sphere or use their finger to draw a triangle in the sand table, recalling various attributes in order to create that particular shape.

Because two-dimensional shapes are flat and three-dimensional shapes are solid, students may draw or build two-dimensional shapes and only build three-dimensional shapes. Shapes could be built using materials such as clay, toothpicks, marshmallows, gumdrops, straws, and pipe cleaners. Students should understand and identify two-dimensional shapes used to construct three-dimensional shapes.

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?"*

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.GL.A.2 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding

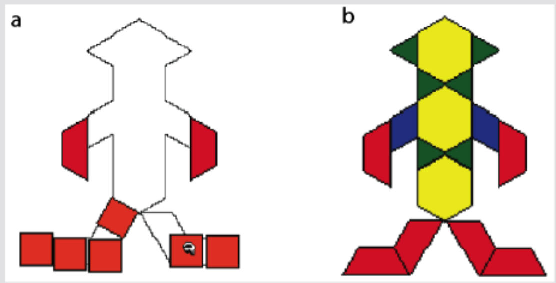
Examples and Explanations

This standard moves beyond identifying and classifying simple shapes to manipulating two or more shapes to create a new shape. This concept begins to develop as students move, rotate, flip, and arrange puzzle pieces to complete a puzzle. Kindergarteners use their experiences with puzzles to use simple shapes to create different shapes.

For example, when using basic shapes to create a picture, a student flips and turns triangles to make a rectangular house.

Students also combine shapes to build pictures. They first use trial and error (part a) and gradually consider components (part b).

Combining shapes to build pictures



Data Analysis & Measurement

A. Describe and compare measurable attributes. In this cluster, the terms students should learn to use with increasing precision are **length, weight, heavy(ier), light(er), long(er), big(ger), small(er), more of, less of, longer, taller, shorter, and compare.**

K.DM.A.1 Describe measurable attributes of a set of objects, such as length or weight.

- Given a single object, describe several measurable attributes.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

Students describe measurable attributes of objects, such as length, weight, and size. For example, a student may describe a shoe with one attribute ("My shoe is heavy!") or more than one attribute ("This shoe is heavy! It's also really long.").

Students often initially hold undifferentiated views of measurable attributes, saying that one object is "bigger" than another, whether it is longer, or greater in area, or greater in volume, and so forth. For example, two students might both claim that their block building is "the biggest" when one building may be taller (have a greater length), and another may have a larger base (be greater in area). Through dialog and discussions, students can learn to discriminate and name the measurable attributes of the objects being compared. As they discuss these situations and compare objects using different attributes, they learn to distinguish, label, and describe several measurable attributes of a single object. Thus, teachers listen for and extend conversations about things that are "big," or "small," as well as "long," "tall," or "high," and name, discuss, and demonstrate with gestures the attribute being discussed.

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

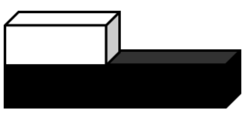
- For example, directly compare the heights of two children and describe one child as taller/shorter.

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Additional Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.DM.A.1 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding

Examples and Explanations

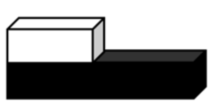
Direct comparisons are made when objects are put next to each other, such as two children, two books, and two pencils. For example, a student may line up two blocks and say, “The blue block is a lot longer than the white one.” Students are not comparing objects that cannot be moved and lined up next to each other.



Similar to the development of the understanding that keeping track is important to obtain an accurate count, kindergarten students need ample experience with comparing objects in order to discover the importance of lining up the ends of objects in order to have an accurate measurement.

As this concept develops, children move from the idea that “Sometimes this block is longer than this one and sometimes it’s shorter (depending on how I lay them side by side) and that’s okay” to the understanding that “This block is always longer than this block (with each end lined up appropriately).” Since this understanding requires conservation of length, a developmental milestone for young children, kindergarteners need multiple experiences measuring a variety of items and discussing findings with one another.

“Sometimes this block is longer and sometimes it’s shorter.”



“The dark block is always longer than this block”

As students develop conservation of length, learning and using language such as “It looks longer, but it really isn’t longer” is helpful.

B. Classify objects and count the number of objects in categories. In this cluster, the terms students should learn to use with increasing precision are color words (e.g., blue, green, red, etc.), descriptive words (e.g., small, big, rough, smooth, bumpy, round, flat, etc.), more, less, same amount, compare, sort, and category.

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

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

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** K.NOF.C.5, K.DM.A.2 **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding, Procedural Skill and Fluency
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?" 6. Compare two numbers between 1 and 20 to identify which is greater or less.		

Examples and Explanations

Students identify similarities and differences between objects (e.g., size, color, shape) and use the identified attributes to sort a collection of objects. Once the objects are sorted, the student counts the amount in each set. Once each set is counted, the student is asked to sort (or group) each of the sets by the amount in each set. Thus, like amounts are grouped together, but not necessarily ordered.

For example, when exploring a collection of buttons, the following may occur:

First, the student separates the buttons into different piles based on color (all the blue buttons are in one pile, all the orange buttons are in a different pile, etc.).

Then the student counts the number of buttons in each pile: blue (5), green (4), orange (3), purple (4).

Finally, the student organizes the groups by quantity. "I put the purple buttons next to the green buttons because purple also had (4). Blue has 5 and orange has 3. There aren't any other colors that have 5 or 3. So they are sitting by themselves."

This objective helps to build a foundation for data collection in future grades as they create and analyze various graphical representations.

C. Work with money. In this cluster, the terms students should learn to use with increasing precision are penny, pennies, nickel, nickels, dime, dimes, quarter, quarters, value, and cent.

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

Standard Overview

Core Tenets		
Focus	**Coherence**	**Rigor**
Supporting Content	**Remediation - Previous Grade(s) Standard:** none **Kindergarten Standard Taught in Advance:** none **Kindergarten Standard Taught Concurrently:** none	Conceptual Understanding
Foundational Skills: 3. Count out 0-20 objects and count groups of objects up to 20. 4. Count to answer "How many?"		

Examples and Explanations

Given one or a group of one of the indicated coins, students state the name of the coin and its value.

Given a group of up to 10 coins of mixed type, students separate coins by type and write a numeral to indicate the number of each type of coin.

Students will also engage in understanding fair-trade values within a dime. For example, they will recognize that different combinations of coins can represent the same value, such as 5 pennies being equivalent to 1 nickel.

To reinforce terminology, students might solve word problems involving no more than 10 coins of the same type, using real coins (or images of real coins) to represent the problem.

Example:

- Joe had 6 pennies. He uses 2 pennies to buy gum. How many pennies does Joe have now?

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.

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**[3]
Put Together / Take Apart[2]	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 she put in her red vase and how many in her 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[4]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("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 "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (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 "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (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.