Supporting
California's Standards

Mathematics Bookmarks

Standards Reference to Support Planning and Instruction

1st Grade

Tulare County Office of Education

Tim A. Hire, County Superintendent of Schools

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1st Grade – CCSS for Mathematics

Grade-Level Introduction

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

(1) Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

(2) Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.

(3) Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement.

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(4) Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

FLUENCY
In kindergarten through grade six there are individual content standards that set expectations for fluency with computations using the standard algorithm (e.g., "fluently" multiply multi-digit whole numbers using the standard algorithm (5.NBT.5▲). Such standards are culminations of progressions of learning, often spanning several grades, involving conceptual understanding (such as reasoning about quantities, the base-ten system, and properties of operations), thoughtful practice, and extra support where necessary. The word "fluent" is used in the standards to mean "reasonably fast and accurate" and the ability to use certain facts and procedures with enough facility that using them does not slow down or derail the problem solver as he or she works on more complex problems. Procedural fluency requires skill in carrying out procedures flexibly, accurately, efficiently, and appropriately. Developing fluency in each grade can involve a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.

Explanations of Major, Additional and Supporting Cluster-Level Emphases
Major3 [m] clusters – areas of intensive focus where students need fluent understanding and application of the core concepts. These clusters require greater emphasis than the others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. The ▲ symbol will indicate standards in a Major Cluster in the narrative.
Additional [a] clusters – expose students to other subjects; may not connect tightly or explicitly to the major work of the grade Supporting [s] clusters – rethinking and linking; areas where some material is being covered, but in a way that applies core understanding; designed to support and strengthen areas of major emphasis. *A Note of Caution: Neglecting material will leave gaps in students' skills and understanding and will leave students unprepared for the challenges of a later grade.

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Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Mathematical Practices

1. **Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

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.

Students:	Teachers:
• Analyze and explain the meaning of the problem • Actively engage in problem solving (Develop, carry out, and refine a plan) • Show patience and positive attitudes • Ask if their answers make sense • Check their answers with a different method	• Pose rich problems and/or ask open ended questions • Provide wait-time for processing/finding solutions • Circulate to pose probing questions and monitor student progress • Provide opportunities and time for cooperative problem solving and reciprocal teaching

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2. **Reason abstractly and quantitatively.**
   Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

In first grade, younger students recognize that a number represents a specific quantity. They connect the quantity to written symbols. Quantitative reasoning entails creating a representation of a problem while attending to the meanings of the quantities.

Students:	Teachers:
• Represent a problem with symbols • Explain their thinking • Use numbers flexibly by applying properties of operations and place value • Examine the reasonableness of their answers/calculations	• Ask students to explain their thinking regardless of accuracy • Highlight flexible use of numbers • Facilitate discussion through guided questions and representations • Accept varied solutions/representations

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3. **Construct viable arguments and critique the reasoning of others.** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments. Students build proofs by induction and proofs by contradiction. CA 3.1 (for higher mathematics only).

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 listen to others' explanations. They decide if the explanations make sense and ask questions.

Students:	Teachers:
• Make reasonable guesses to explore their ideas • Justify solutions and approaches • Listen to the reasoning of others, compare arguments, and decide if the arguments of others makes sense • Ask clarifying and probing questions	• Provide opportunities for students to listen to or read the conclusions and arguments of others • Establish and facilitate a safe environment for discussion • Ask clarifying and probing questions • Avoid giving too much assistance (e.g., providing answers or procedures)

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

In first grade, 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.

Students:	Teachers:
• Make reasonable guesses to explore their ideas • Justify solutions and approaches • Listen to the reasoning of others, compare arguments, and decide if the arguments of others makes sense • Ask clarifying questions	• Allow time for the process to take place (model, make graphs, etc.) • Model desired behaviors (think alouds) and thought processes (questioning, revision, reflection/written) • Make appropriate tools available • Create an emotionally safe environment where risk taking is valued • Provide meaningful, real world, authentic, performance-based tasks (non traditional work problems)

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5. **Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

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.

Students:	Teachers:
• Select and use tools strategically (and flexibly) to visualize, explore, and compare information • Use technological tools and resources to solve problems and deepen understanding	• Make appropriate tools available for learning (calculators, concrete models, digital resources, pencil/paper, compass, protractor, etc.) • Use tools with their instruction

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6. **Attend to precision.** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

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.

Students:	Teachers:
• Calculate accurately and efficiently • Explain their thinking using mathematics vocabulary • Use appropriate symbols and specify units of measure	• Recognize and model efficient strategies for computation • Use (and challenging students to use) mathematics vocabulary precisely and consistently

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7. **Look for and make use of structure.** Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 x 8 equals the well-remembered 7 x 5 + 7 x 3, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 x 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

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.*

Students:	Teachers:
• Look for, develop, and generalize relationships and patterns • Apply reasonable thoughts about patterns and properties to new situations	• Provide time for applying and discussing properties • Ask questions about the application of patterns • Highlight different approaches for solving problems

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8. **Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

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?"

Students:	Teachers:
• Look for methods and shortcuts in patterns and repeated calculations • Evaluate the reasonableness of results and solutions	• Provide tasks and problems with patterns • Ask about possible answers before, and reasonableness after computations

8. **Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

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?"

Students:	Teachers:
• Look for methods and shortcuts in patterns and repeated calculations • Evaluate the reasonableness of results and solutions	• Provide tasks and problems with patterns • Ask about possible answers before, and reasonableness after computations

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Grade 1 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

Number and Operations in Base Ten

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.

Geometry

- Reason with shapes and their attributes

1st Grade – CCSS for Mathematics

Grade 1 Overview

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CCSS Where to Focus Grade 1 Mathematics

Not all of the 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 their 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 Standards for Mathematical Practice.

To say that some things have a greater emphasis is not to say that anything in the standards can be safely neglected in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

MAJOR, SUPPORTING, AND ADDITIONAL CLUSTERS FOR GRADE 1

Emphases are given at the cluster level. Refer to the Common Core State Standards for Mathematics for the specific standards that fall within each cluster.

Key: ■ Major Clusters □ Supporting Clusters ○ Additional Clusters

1.OA.A	■	Represent and solve problems involving addition and subtraction.
1.OA.B	■	Understand and apply properties of operations and the relationship between addition and subtraction.
1.OA.C	■	Add and subtract within 20.
1.OA.D	■	Work with addition and subtraction equations.
1.NBT.A	■	Extending the counting sequence.
1.NBT.B	■	Understand place value.
1.NBT.C	■	Use place value understanding and properties of operations to add and subtract.
1.MD.A	■	Measure lengths indirectly and by iterating length units.
1.MD.B	○	Tell and write time.
1.MD.C	□	Represent and interpret data.
1.G.A	○	Reason with shapes and their attributes.

REQUIRED FLUENCIES FOR GRADE 1

1.OA.C.6	Add/subtract within 10

Student Achievement Partners, Achieve the Core http://achievethecore.org/, Focus by Grade Level, http://achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12/page/774/focus-by-grade-level

1st Grade – CCSS for Mathematics

CCSS Where to Focus Grade 1 Mathematics

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1.OA.A ■ Represent and solve problems involving addition and subtraction.
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1.MD.A ■ Measure lengths indirectly and by iterating length units.
1.MD.B ○ Tell and write time.
1.MD.C □ Represent and interpret data.
1.G.A ○ Reason with shapes and their attributes.

REQUIRED FLUENCIES FOR GRADE 1

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Student Achievement Partners, Achieve the Core http://achievethecore.org/, Focus by Grade Level, http://achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12/page/774/focus-by-grade-level

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1st Grade – CCSS for Mathematics

1.OA.A Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Essential Skills and Concepts:

- ☐ Add and Subtract within 20
- ☐ Solve word problems
- ☐ Write a number sentence
- ☐ Visually represent addition and subtraction problems

Question Stems and Prompts:

- ✓ Draw a picture to go with this problem.
- ✓ Explain how you got your answer.
- ✓ Use a number line to solve this problem.
- ✓ Use manipulatives to solve this problem.
- ✓ Write a number sentence for this word problem.

Vocabulary	**Spanish Cognates**
Tier 2	
• symbol	símbolo
• put together	
• take apart	
• comparing	comparar
Tier 3	
• addition	adición
• subtraction	
• plus sign	
• minus sign	signo menos
• equal sign	signo igual
• greater than	
• less than	
• equal	igual
• total	total
• difference	diferencia
• equation	ecuación
• addends	
• sum	suma

Standards Connections

1.OA.1 → 1.OA.2, 1.OA.1 → 1.MD.4

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Standards Connections

1.OA.1 → 1.OA.2, 1.OA.1 → 1.MD.4

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Standard Explanation

Students in first grade add and subtract within 20 (1.OA.1–2▲) to solve the types of problems shown.

Add to Problems

Result Unknown	Change Unknown	Start Unknown
Chris has 11 toy cars. José gave him 5 more. How many does Chris have now? *General Case:* $A + B =$ □.	Bill had 5 toy robots. His mom gave him some more. Now he has 9 robots. How many toy robots did his mom give him? *General Case:* $A +$ □ $= C$.	Some children were playing on the playground, and 5 more children joined them. Then there were 12 children. How many children were playing before? *General Case:* □ $+ B = C$.

Take From

Result Unknown	Change Unknown	Start Unknown
There were 20 oranges in the bowl. The family ate 5 oranges from the bowl. How many oranges are left in the bowl? *General Case:* $C – B =$ □.	Andrea had 8 stickers. She gave some stickers away. Now she has 2 stickers. How many stickers did she give away? *General Case:* $C –$ □ $= A$.	Some children were lining up for lunch. Four (4) children left, and then there were 6 children still waiting in line. How many children were there before? *General Case:* □ $– B = A$.

Put Together/Take Apart

Total Unknown	Addend Unknown	Both Addends Unknown
There are 6 blue blocks and 7 red blocks in the box. How many blocks are there? *General Case:* $A + B =$ □.	Roger puts 10 apples in a fruit basket. Four (4) are red and the rest are green. How many are green? *General Cases:* $A +$ □ $= C$. $C – A =$ □.	Grandma has 9 flowers. How many can she put in her green vase and how many in her purple vase? *General Case:* C = □□□.

Compare

Difference Unknown	Bigger Unknown	Smaller Addends Unknown
Pat has 9 peaches. Lynda has peaches. How many more peaches does Lynda have than Pat? *General Cases:* $A +$ □ $= C$. $C – A =$ □.	Theo has 7 action figures. Rosa has 2 more action figures than Theo. How many action figures does Rosa have? *General Case:* $A + B =$ □.	Bill has 8 stamps. Lisa has 2 fewer stamps than Bill. How many stamps does Lisa have? *General Case:* $C – B =$ □. □ $+ B = C$.

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1st Grade – CCSS for Mathematics

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1.OA.A Represent and solve problems involving addition and subtraction.

1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Essential Skills and Concepts:

- ☐ Add three numbers within 20
- ☐ Use visual representation to demonstrate addition of three numbers.
- ☐ Solve problems with unknown numbers

Question Stems and Prompts:

- ✓ Draw a picture to go with this problem.
- ✓ Explain how you got your answer.
- ✓ Use a number line to solve this problem.
- ✓ Use manipulatives to solve this problem.
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Vocabulary	**Spanish Cognates**
Tier 2	
• symbol	símbolo
• put together	
• unknown	
Tier 3	
• addition	adición
• equation	ecuación
• sum	suma
• total	total

Standards Connections

1.OA.2 → 1.MD.4

1st Grade – CCSS for Mathematics

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Standard Explanation

Grade-one students solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 (1.OA.2▲). Students can collaborate in small groups to develop problem- solving strategies. Grade-one students use a variety of strategies and models—such as drawings, words, and equations with symbols for the unknown numbers—to find solutions. Students explain, write, and reflect on their problem-solving strategies (MP.1, MP.2, MP.3, MP.4, MP.6). For example, each student could write or draw a problem in which three groups of items (whose sum is within 20) are to be combined. Students might exchange their problems with other students, solve them individually, and then discuss their models and solution strategies. The students work together to solve each problem using a different strategy. The level of difficulty for these problems also may be differentiated by using smaller numbers (up to 10) or larger numbers (up to 20) (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.OA.2 Example:

At the farm, there are 6 cows, 5 pigs, and 4 horses. How many animals are at the farm? Show your thinking in the space below.

Howard County Public County School System, https://grade1commoncoremath.wikispaces.hcpss.org/Assessing+1.OA.2

1st Grade – CCSS for Mathematics

1.OA.A Represent and solve problems involving addition and subtraction.

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1st Grade – CCSS for Mathematics

1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.3 Apply properties of operations as strategies to add and subtract.[3] *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

Essential Skills and Concepts:
- ☐ Add and Subtract
- ☐ Commutative Property
- ☐ Associative Property

Question Stems and Prompts:
- ✓ What can you tell me about this equation?
- ✓ How can we solve this equation?
- ✓ Do you know any facts that can help solve this equation?
- ✓ Can you make a ten to help you solve this equation?

Vocabulary	**Spanish Cognates**
Tier 2	
• put together	
• take apart	
Tier 3	
• make ten	
• addition	adición
• subtraction	
• commutative property	propiedad conmutativa
• associative property	propiedad asociativa

Standards Connections
1.OA.3 – 1.OA.4, 1.OA.3 → 1.OA.6, 1.OA.3 → 2.NBT.9

[3] Students need not use formal terms for these properties.

1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

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Standards Connections
1.OA.3 – 1.OA.4, 1.OA.3 → 1.OA.6, 1.OA.3 → 2.NBT.9

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1st Grade – CCSS for Mathematics

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Standard Explanation

Students apply properties of operations as strategies to add and subtract (1.OA.3▲). Although it is not necessary for grade-one students to learn the names of the properties, students need to understand the important ideas of the following properties:

- **Identity property of addition** (e.g., 6 = 6 + 0) – adding 0 to a number results in the same number.
- **Identity property of subtractions** (e.g., 9 – 0 = 9) – subtracting 0 from a number results in the same **number.**
- **Commutative property of addition** (e.g., 4 + 5 = 5 + 4) – the order in which you add numbers does not matter.
- **Associative property of addition** (e.g., 3 + (9 + 1) = (3 + 9) + 1 = 12 + 1 = 13) – when adding more than two numbers, it does not matter which numbers are added together first.

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.OA.3 Example:

To show that order does not change the result in the operation of addition, students build a tower of 8 green cubes and 3 yellow cubes, and another tower of 3 yellow cubes and 8 green cubes. Students can also use cubes of 3 different colors to demonstrate that (2 + 6) + 4 is equivalent to 2 + (6 + 4) and then to prove 2 + (6 + 4) = 2 + 10. (CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

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1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Essential Skills and Concepts:
- ☐ Add and Subtract
- ☐ Use addition to solve subtraction problems.
- ☐ Write a subtraction equation as an addition equation with a missing addend.

Question Stems and Prompts:
- ✓ What addition equation could help you solve this problem?
- ✓ How did you find the answer?
- ✓ Can you add on (count on) to solve this equation?

Vocabulary	**Spanish Cognates**
Tier 2	
• take apart	
• missing number	
Tier 3	
• subtraction	
• equation	ecuación
• number sentence	
• unknown-addend	

Standards Connections
1.OA.4 – 1.OA.3, 1.OA.4 → 1.OA.6

1st Grade – CCSS for Mathematics

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Standards Connections
1.OA.4 – 1.OA.3, 1.OA.4 → 1.OA.6

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1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Standard Explanation

Students understand subtraction as an unknown-addend problem (1.OA.4▲). Word problems such as put together/take apart (with addend unknown) afford students a context to see subtraction as the opposite of addition by finding an unknown addend. Understanding subtraction as an unknown- addend addition problem is one of the essential understandings students will need in middle school to extend arithmetic to negative rational numbers (adapted from ADE 2010 and UA Progressions Documents 2011a) (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.OA.4 Illustrative Task:

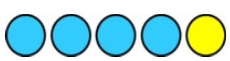
- Fact Families with Pictures, https://www.illustrativemathematics.org/content-standards/1/OA/B/tasks/1612

1.OA Fact Families with Pictures

Task

Write as many equations for each picture as you can.

a. Use the numbers 4, 1, and 5.

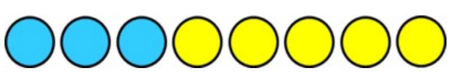


Here are some equations for this picture.

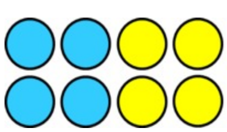
$4 + 1 = 5$	$5 = 4 + 1$
$5 - 1 = 4$	$4 = 1 - 5$

Can you find more equations?

b. Use the numbers 3, 5, and 8.



c. Use the numbers 4, 4, and 8.



1st Grade – CCSS for Mathematics

1.OA.B Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Standard Explanation

Students understand subtraction as an unknown-addend problem (1.OA.4▲). Word problems such as put together/take apart (with addend unknown) afford students a context to see subtraction as the opposite of addition by finding an unknown addend. Understanding subtraction as an unknown- addend addition problem is one of the essential understandings students will need in middle school to extend arithmetic to negative rational numbers (adapted from ADE 2010 and UA Progressions Documents 2011a) (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.OA.4 Illustrative Task:

- Fact Families with Pictures, https://www.illustrativemathematics.org/content-standards/1/OA/B/tasks/1612

1.OA Fact Families with Pictures

Task

Write as many equations for each picture as you can.

a. Use the numbers 4, 1, and 5.

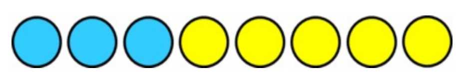
Here are some equations for this picture.

$4 + 1 = 5$ $5 = 4 + 1$

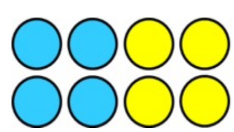
$5 - 1 = 4$ $4 = 1 - 5$

Can you find more equations?

b. Use the numbers 3, 5, and 8.



c. Use the numbers 4, 4, and 8.



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1.OA.C Add and subtract within 20.

1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

Essential Skills and Concepts:
- ☐ Understand addition
- ☐ Understand subtraction
- ☐ Count on to solve problems
- ☐ Count back to solve

Question Stems and Prompts:
- ✓ Count on to find the sum.
- ✓ Count back to find the difference.
- ✓ How could you solve this number sentence?

Vocabulary Tier 3	**Spanish Cognates**
• counting on	contando con
• count back	
• total	total
• difference	diferencia
• addition	adición
• subtraction	

Standards Connections
1.OA.5 → 1.OA.6

1st Grade – CCSS for Mathematics

1.OA.C Add and subtract within 20.

1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

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- ☐ Understand addition
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- ✓ Count on to find the sum.
- ✓ Count back to find the difference.
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Vocabulary Tier 3	**Spanish Cognates**
• counting on	contando con
• count back	
• total	total
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• addition	adición
• subtraction	

Standards Connections
1.OA.5 → 1.OA.6

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1.OA.C Add and subtract within 20.
1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

Standard Explanation

Primary students come to understand addition and subtraction as they connect counting and number sequence to these operations (1.OA.5▲). First-grade students connect *counting on* and *counting back* to addition and subtraction. For example, students count on (3) from 4 to solve the addition problem 4 + 3 = 7. Similarly, students count back (3) from 7 to solve the subtraction problem 7 – 3 = 4. The "counting all" strategy requires students to count an entire set. The "counting on" and "counting back" strategies occur when students are able to hold the start number in their head and count on from that number. Students generally have difficulty knowing where to begin their count when counting backward, so it is much better to restate the subtraction as an unknown addend and solve by counting on: "7 – 3 means 3+☐=7, so 4,5,6,7... I counted on 4 more to get to 7, so 4 is the answer." Solving subtraction problems by counting on helps to reinforce the concept that subtraction problems are missing-addend problems, which is important for students' later understanding of operations with rational numbers (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.OA.5 Examples:

Carly was working to solve a math problem. She solved the problem by counting on, and she counted out loud.

Carly counted, "6…7…8…9…10…11…12…13."

What is a problem that Carly could have been solving? Why do you think so?

Austin was using a number line to solve a math problem. He started at 13 and counted backwards. He stopped when he got to 8. Write a number sentence to show the problem that Austin could have been solving.

____

Howard County Public School System, https://grade1commoncoremath.wikispaces.hcpss.org/Assessing+1.OA.5

1st Grade – CCSS for Mathematics

1.OA.C Add and subtract within 20.
1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

Standard Explanation

Primary students come to understand addition and subtraction as they connect counting and number sequence to these operations (1.OA.5▲). First-grade students connect *counting on* and *counting back* to addition and subtraction. For example, students count on (3) from 4 to solve the addition problem 4 + 3 = 7. Similarly, students count back (3) from 7 to solve the subtraction problem 7 – 3 = 4. The "counting all" strategy requires students to count an entire set. The "counting on" and "counting back" strategies occur when students are able to hold the start number in their head and count on from that number. Students generally have difficulty knowing where to begin their count when counting backward, so it is much better to restate the subtraction as an unknown addend and solve by counting on: "7 – 3 means 3+☐=7, so 4,5,6,7... I counted on 4 more to get to 7, so 4 is the answer." Solving subtraction problems by counting on helps to reinforce the concept that subtraction problems are missing-addend problems, which is important for students' later understanding of operations with rational numbers (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.OA.5 Examples:

Carly was working to solve a math problem. She solved the problem by counting on, and she counted out loud.

Carly counted, "6…7…8…9…10…11…12…13."

What is a problem that Carly could have been solving? Why do you think so?

Austin was using a number line to solve a math problem. He started at 13 and counted backwards. He stopped when he got to 8. Write a number sentence to show the problem that Austin could have been solving.

____

Howard County Public School System, https://grade1commoncoremath.wikispaces.hcpss.org/Assessing+1.OA.5

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1st Grade – CCSS for Mathematics

1.OA.C Add and subtract within 20.

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; 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 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).

Essential Skills and Concepts:
- ☐ Add and subtract within 20.
- ☐ Add and subtract within 10 fluently
- ☐ Counting on
- ☐ Making ten
- ☐ Decomposing numbers
- ☐ Relate addition and subtraction

Question Stems and Prompts:
- ✓ Make a ten to solve.
- ✓ Are there any numbers you could add to make it easier to solve?
- ✓ Are there any related facts that will help solve this problem?
- ✓ Can you solve this problem in more than one way?
- ✓ How did you solve this problem?

Vocabulary	**Spanish Cognates**
Tier 2	
• fluency	fluidez
• related facts	
Tier 3	
• counting on	contando con
• make ten	
• addition	adición
• subtraction	
• decompose numbers	descomponer números

Standards Connections
1.OA.6 → 1.NBT.4, 1.OA.6 → 2.OA.2

1.OA.C Add and subtract within 20.

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; 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 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).

Essential Skills and Concepts:
- ☐ Add and subtract within 20.
- ☐ Add and subtract within 10 fluently
- ☐ Counting on
- ☐ Making ten
- ☐ Decomposing numbers
- ☐ Relate addition and subtraction

Question Stems and Prompts:
- ✓ Make a ten to solve.
- ✓ Are there any numbers you could add to make it easier to solve?
- ✓ Are there any related facts that will help solve this problem?
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Vocabulary	**Spanish Cognates**
Tier 2	
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Standards Connections
1.OA.6 → 1.NBT.4, 1.OA.6 → 2.OA.2

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1.OA.C.6

Standard Explanation

First-grade students use various strategies to add and subtract within 20 (1.OA.6▲). Students need ample opportunities to model operations using various strategies and explain their thinking (MP.2, MP.7, MP.8).

Example: 8 + 7 = ____	1.OA.6▲
Student 1 *(Making 10 and decomposing a number)* I know that 8 plus 2 is 10, so I decomposed (broke up) the 7 into a 2 and a 5. First I added 8 and 2 to get 10, and then I added the 5 to get 15. 8 + 7 = (8 + 2) + 5 = 10 + 5 = 15	Student 2 *(Creating an easier problem with known sums)* I know 8 is 7 + 1. I also know that 7 and 7 equal 14. Then I added 1 more to get 15. 8 + 7 = (7 + 7) + 1 = 15

Example: 14 – 6 = ____	1.OA.6▲
Student 1 *(Decomposing the number you subtract)* I know that 14 minus 4 is 10, so I broke up the 6 into a 4 and a 2. 14 minus 4 is 10. Then I take away 2 more to get 8. 14 – 6 = (14 – 4) – 2 = 10 – 2 = 8	Student 2 *(Relationship between addition and subtraction)* I know that 6 plus 8 is 14, so that means that 14 minus 6 is 8. 6 + 8 = 14, so 14 – 6 = 8. If I didn't know 6 + 8 = 14, I could start by making a ten: 6 + 4 is 10, and 4 more is 14, and 4 plus 4 is 8.

Adapted from ADE 2010 and Georgia Department of Education (GaDOE) 2011.

(CA Mathematics Framework, adopted Nov. 6, 2013)

Methods for Solving Addition and Subtraction Problems

To solve word problems, students learn to apply various computational methods. Kindergarten students generally use Level 1 methods and Level 2 and 3 methods are used in grades one and two.

Methods used for solving single-digit addition and subtraction problems

Level 1: Direct Modeling by Counting All or Taking Away
Represent situation or numerical problem with groups of objects, a drawing, or fingers. Model the situation by composing two addend groups or decomposing a total group. Count the resulting total or addend.

Level 2: Counting On
Embed an addend within the total (the addend is perceived simultaneously as an addend and as part of the total). Count this total but abbreviate the counting by omitting the count of this addend; instead, begin with the number word of this addend. Some method of keeping track (fingers, objects, mentally imaged objects, body motions, other count words) is use to monitor the count.
Methods used to find the total or an addend, depending on what is monitored.

Level 3: Convert to an Easier Problem
Decompose an addend and compose a part with another addend.

(Adapted from the University of Arizona Progressions Documents for the Common Core Math Standards [Progressions], K-5 CC and OA (pg. 12) 2011).

1st Grade – CCSS for Mathematics

1.OA.C.6

Standard Explanation

First-grade students use various strategies to add and subtract within 20 (1.OA.6▲). Students need ample opportunities to model operations using various strategies and explain their thinking (MP.2, MP.7, MP.8).

Example: 8 + 7 = ____ 1.OA.6▲
Student 1 (Making 10 and decomposing a number) I know that 8 plus 2 is 10, so I decomposed (broke up) the 7 into a 2 and a 5. First I added 8 and 2 to get 10, and then I added the 5 to get 15. 8 + 7 = (8 + 2) + 5 = 10 + 5 = 15
Student 2 (Creating an easier problem with known sums) I know 8 is 7 + 1. I also know that 7 and 7 equal 14. Then I added 1 more to get 15. 8 + 7 = (7 + 7) + 1 = 15

Example: 14 – 6 = ____ 1.OA.6▲
Student 1 (Decomposing the number you subtract) I know that 14 minus 4 is 10, so I broke up the 6 into a 4 and a 2. 14 minus 4 is 10. Then I take away 2 more to get 8. 14 – 6 = (14 – 4) – 2 = 10 – 2 = 8
Student 2 (Relationship between addition and subtraction) I know that 6 plus 8 is 14, so that means that 14 minus 6 is 8. 6 + 8 = 14, so 14 – 6 = 8. If I didn't know 6 + 8 = 14, I could start by making a ten: 6 + 4 is 10, and 4 more is 14, and 4 plus 4 is 8.

Adapted from ADE 2010 and Georgia Department of Education (GaDOE) 2011.

(CA Mathematics Framework, adopted Nov. 6, 2013)

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1.OA.D Work with addition and subtraction equations.

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.

Essential Skills and Concepts:
- ☐ Understand the meaning of the equal sign
- ☐ Determine if equations are true or false

Question Stems and Prompts:
- ✓ Are these expressions equal?
- ✓ Is this equation true/false?
- ✓ How do you know this equation is true/false?

Vocabulary	**Spanish Cognates**
Tier 2	
• true	
• false	falso
Tier 3	
• equal	igual
• equation	ecuación
• equality	igualdad
• equal sign	signo igual

Standards Connections
1.OA.7 → 1.OA.8, 1.OA.7 → 2.OA.3, 2.OA.4

1st Grade – CCSS for Mathematics

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Vocabulary / **Spanish Cognates**
Tier 2
- true
- false — falso
Tier 3
- equal — igual
- equation — ecuación
- equality — igualdad
- equal sign — signo igual

Standards Connections
1.OA.7 → 1.OA.8, 1.OA.7 → 2.OA.3, 2.OA.4

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1st Grade – CCSS for Mathematics

1.OA.D Work with addition and subtraction equations.

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Standard Explanation

Students need to understand the meaning of the equal sign (1.OA.7▲) and know that the quantity on one side of the equal sign must be the same quantity as on the other side of the equal sign. Inter- changing the language of *equal to* and *is the same as,* as well as *not equal to* and *is not the same as,* will help students grasp the meaning of the equal sign. To avoid common pitfalls such as the equal sign meaning "to do something" or the equal sign meaning "the answer is," students should be able to:

- Express their understanding of the meaning of the equal sign;
- Realize that sentences other than $a + b = c$ are true (e.g., $a = a$, $c = a + b$, $a = a + 0$, $a + b = b + a$);
- Know the equal sign represents a relationship between two equal quantities;
- Compare expressions without calculating. For example, a student evaluates 3 + 4 = 3 + 3 + 2. She says, "I know this statement is false because there is a 3 on both sides of the equal sign, but the right side has 3 + 2, and that makes 5, which is more than 4. So the two sides can't be equal."
(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.OA.7 Illustrative Task:

- Valid Equalities?, https://www.illustrativemathematics.org/content-standards/1/OA/D/7/tasks/466

Decide if the equations are true or false. Explain your answer.

a. $2 + 5 = 6$

b. $3 + 4 = 2 + 5$

c. $8 = 4 + 4$

d. $3 + 4 + 2 = 4 + 5$

e. $5 + 3 = 8 + 1$

f. $1 + 2 = 12$

g. $12 = 10 + 2$

h. $3 + 2 = 2 + 3$

i. $32 = 23$

1.OA.D Work with addition and subtraction equations.

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false?* $6 = 6$, $7 = 8 – 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.

Standard Explanation

Students need to understand the meaning of the equal sign (1.OA.7▲) and know that the quantity on one side of the equal sign must be the same quantity as on the other side of the equal sign. Inter- changing the language of *equal to* and *is the same as,* as well as *not equal to* and *is not the same as,* will help students grasp the meaning of the equal sign. To avoid common pitfalls such as the equal sign meaning "to do something" or the equal sign meaning "the answer is," students should be able to:

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- Know the equal sign represents a relationship between two equal quantities;
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1.OA.7 Illustrative Task:

- Valid Equalities?, https://www.illustrativemathematics.org/content-standards/1/OA/D/7/tasks/466

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a. $2 + 5 = 6$

b. $3 + 4 = 2 + 5$

c. $8 = 4 + 4$

d. $3 + 4 + 2 = 4 + 5$

e. $5 + 3 = 8 + 1$

f. $1 + 2 = 12$

g. $12 = 10 + 2$

h. $3 + 2 = 2 + 3$

i. $32 = 23$

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1.OA.D Work with addition and subtraction equations.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 = □.*

Essential Skills and Concepts:
- □ Find unknown numbers in equations
- □ Relate addition to subtraction to solve for unknowns

Question Stems and Prompts:
- ✓ What number that makes this equation true?
- ✓ How did you figure out the unknown number?

Vocabulary	**Spanish Cognates**
Tier 2	
• unknown	
• missing	
• true	
• related facts	
Tier 3	
• equation	ecuación

Standards Connections
1.OA.8 – 1.OA.1

1st Grade – CCSS for Mathematics

1.OA.D Work with addition and subtraction equations.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 = □.*

Essential Skills and Concepts:
- □ Find unknown numbers in equations
- □ Relate addition to subtraction to solve for unknowns

Question Stems and Prompts:
- ✓ What number that makes this equation true?
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Vocabulary	**Spanish Cognates**
Tier 2	
• unknown	
• missing	
• true	
• related facts	
Tier 3	
• equation	ecuación

Standards Connections
1.OA.8 – 1.OA.1

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1.OA.D Work with addition and subtraction equations.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 = □.*

Standard Explanation

This standard is critical in developing students' problem solving skills, algebraic foundations, and understanding of addition and subtraction. There are two types of part-part-whole problems. In one type, the sizes of both parts are given and the student has to find the whole. Or students are given the size of one part and the size of the whole, and they need to find the size of the missing part. This concept is an extension of decomposing of numbers and students will use their understanding of decomposition of numbers when finding the missing part. Students may need to use counters to see how a number can be broken up into different parts before moving to the more abstract representation. (Howard County Public School System, https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.8)

1.OA.8 Illustrative Task:

- Find the Missing Number, https://www.illustrativemathematics.org/content-standards/1/OA/D/8/tasks/4

1.OA Find the Missing Number

Task

Find the missing number in each of the following equations:

9 – 3 = □	8 + □ = 15	16 – □ = 5
□ = 7 – 2	13 = □ + 7	6 = 14 – □

1st Grade – CCSS for Mathematics

1.OA.D Work with addition and subtraction equations.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 = □.*

Standard Explanation

This standard is critical in developing students' problem solving skills, algebraic foundations, and understanding of addition and subtraction. There are two types of part-part-whole problems. In one type, the sizes of both parts are given and the student has to find the whole. Or students are given the size of one part and the size of the whole, and they need to find the size of the missing part. This concept is an extension of decomposing of numbers and students will use their understanding of decomposition of numbers when finding the missing part. Students may need to use counters to see how a number can be broken up into different parts before moving to the more abstract representation. (Howard County Public School System, https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.8)

1.OA.8 Illustrative Task:

- Find the Missing Number, https://www.illustrativemathematics.org/content-standards/1/OA/D/8/tasks/4

1.OA Find the Missing Number

Task

Find the missing number in each of the following equations:

9 – 3 = □ 8 + □ = 15 16 – □ = 5
□ = 7 – 2 13 = □ + 7 6 = 14 – □

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1.NBT.A Extend the counting sequence.

1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Essential Skills and Concepts:
- ☐ Count to 120
- ☐ Count from a given number to 120
- ☐ Read numerals to 120
- ☐ Write numerals to 120
- ☐ Represent a number of objects with a numeral

Question Stems and Prompts:
- ✓ Count to 120 from ______.
- ✓ Write numbers to 120.
- ✓ Write the numeral _____.
- ✓ Write the numeral for how many objects are in this group.

Vocabulary	**Spanish Cognates**
Tier 2	
• read	
• write	
• represent	representar
Tier 3	
• count	contar
• numbers	números
• numeral	

Standards Connections
1.NBT.1 → 1.NBT.2

1st Grade – CCSS for Mathematics

1.NBT.A Extend the counting sequence.

1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Essential Skills and Concepts:
- ☐ Count to 120
- ☐ Count from a given number to 120
- ☐ Read numerals to 120
- ☐ Write numerals to 120
- ☐ Represent a number of objects with a numeral

Question Stems and Prompts:
- ✓ Count to 120 from ______.
- ✓ Write numbers to 120.
- ✓ Write the numeral _____.
- ✓ Write the numeral for how many objects are in this group.

Vocabulary	**Spanish Cognates**
Tier 2	
• read	
• write	
• represent	representar
Tier 3	
• count	contar
• numbers	números
• numeral	

Standards Connections
1.NBT.1 → 1.NBT.2

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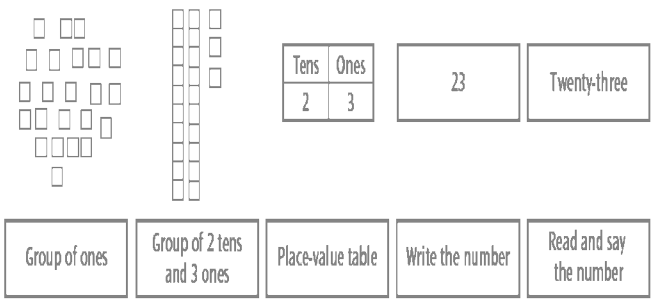
Standard Explanation

First-grade students extend reading and writing numerals beyond 20—to 120. Students use objects, words, and symbols to express their understanding of numbers. For a given numeral, students count out the given number of objects, identify the quantity that each digit represents, and write and read the numeral (MP.2, MP.7, MP.8). For example:



Source: Ohio Department of Education (ODE) 2011.

Seeing different representations can help students develop an understanding of numbers. Posting the number words in the classroom helps students to read and write the words. Extending hundreds charts to 120 and displaying them in the classroom can help students connect place value to the numerals and the words for the numbers 1 to 120. Students may need extra support with decade and century numbers when they orally count to 120. These transitions will be signaled by a 9 and require new rules to generate the next set of numbers. Students need experience counting from different starting points (e.g., start at 83 and count to 120). (CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.NBT.1 Illustrative Task:

- Hundred Chart Digit Game, https://www.illustrativemathematics.org/content-standards/1/NBT/A/1/tasks/680

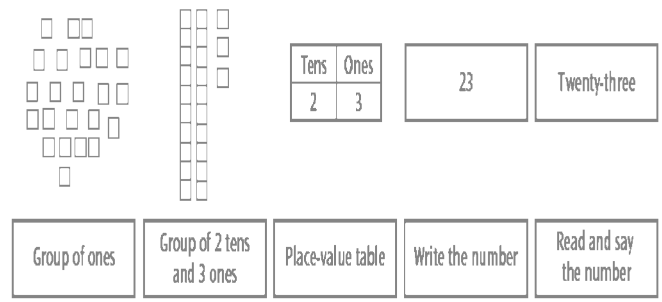
Materials
- A 100 chart per pair of students
- A set of digit cards per pair of students (four each of cards 0-9)
- Two different colors of counting chips, one for each student

Action
- Player One draws two cards and then makes and reads aloud both of the numbers that can be made with those digits. Player One then chooses which of the two numbers to cover on their 100 chart.
- Player Two draws two cards and then makes and reads aloud both of his /her numbers and chooses which number to cover on the 100 chart.
- Players cannot cover a number that has already been covered, but they may have more than one counter in each row.
- If a player cannot make a number that is uncovered/available with the cards they drew, they lose their turn for that round.
- Play continues until one player has at least one number covered in each row of the 100 chart.
- If students run out of cards they should re-shuffle the cards and continue play.
- For a shorter version, students work together to cover at least one number in each row on the 100 chart.
- This can be extended by asking students to record the numbers they create.

1st Grade – CCSS for Mathematics

Standard Explanation

First-grade students extend reading and writing numerals beyond 20—to 120. Students use objects, words, and symbols to express their understanding of numbers. For a given numeral, students count out the given number of objects, identify the quantity that each digit represents, and write and read the numeral (MP.2, MP.7, MP.8). For example:



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1st Grade – CCSS for Mathematics

1.NBT.B Understand place value.

1.NBT.2a Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones – called a "ten."
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
c. 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).

Essential Skills and Concepts:

- ☐ Represent 10 as ten ones.
- ☐ Represent numbers 11 to 19 as a ten and some ones.
- ☐ Represent multiples of ten using number names (2 tens is 20).
- ☐ Two digit numbers are composed of tens and ones

Question Stems and Prompts:

- ✓ How many tens and ones does the number ___ have?
- ✓ How many tens in the number ____ ?
- ✓ What number is _____ tens?
- ✓ What is the value of the ____ in the number ____?

Math Vocabulary	**Spanish Cognates**
Tier 3	
• numbers	números
• place value	
• tens	
• ones	
• digit	dígito

Standards Connections

1.NBT.2 → 1.NBT.3, 1.NBT.4, 1.NBT.5, 6
1.NBT.2 → 1.MD.4

1.NBT.B Understand place value.

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1.NBT.2 → 1.MD.4

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1st Grade – CCSS for Mathematics

1.NBT.B.2

Standard Explanation

Understanding the concept of a ten is fundamental to young students' mathematical development. This is the foundation of the place-value system. In kindergarten, students thought of a group of 10 cubes as 10 individual cubes. First-grade students understand 10 cubes as a bundle of 10 ones, or a ten (1.NBT.2a). Students can demonstrate this concept by counting 10 objects and "bundling" them into one group of 10 (MP.2, MP.6, MP.7, MP.8). Students count between 10 and 20 objects and can make a bundle of 10 with or without some left over, which can help students write teen numbers (1.NBT.2b). They can continue counting any number of objects up to 99, making bundles of tens with or without leftovers (1.NBT.2c). For example:

- Teacher: For the number 42, do you have enough to make 4 tens? Would you have any left? If so, how many would you have left?
- Student 1: I filled 4 10-frames to make 4 tens and had 2 counters left over. I had enough to make 4 tens with some left over. The number 42 has 4 tens and 2 ones.
- Student 2: I counted out 42 place-value cubes. I traded each group of 10 cubes for a 10-rod (stick). I now have 4 10-rods and 2 cubes left over. So the number 42 has 4 tens and 2 ones (adapted from ADE 2010).

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.NBT.2 Illustrative Task:

- Roll and Build, https://www.illustrativemathematics.org/content-standards/1/NBT/B/2/tasks/987

Materials

For each pair:
- 2 ten-sided dice with the numbers 0 to 9 or two spinners with the numbers 0 to 9
- Base-10 blocks, linking cubes, or bundled and loose popsicle sticks
- Paper and pencil

Play
- Student A rolls the dice.
- Student B makes a number using the values on the dice as digits and both students write it on the paper. For example, if student A rolled a 3 and a 4, the number can be 34 or 43.
- Student A represents the number with the tens and ones blocks/popsicle sticks.
- Student B counts the blocks to check that they correctly represent the number.
- Both students draw a picture of the tens and ones on the paper.

The students should take turns.

1.NBT.B.2

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1.NBT.B Understand place value.

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Essential Skills and Concepts:
- ☐ Compare two-digit numbers
- ☐ Understand tens and ones
- ☐ Understanding of the symbols <, >, and =.

Question Stems and Prompts:
- ✓ Compare these numbers.
- ✓ What symbol makes the number sentence true?
- ✓ Read the following ______ <, >, or = _____.
- ✓ How do you know how to compare these numbers?

Vocabulary	**Spanish Cognates**
Tier 2	
• compare	comparar
Tier 3	
• less than	
• greater than	
• equal to	igual a
• digits	dígitos

1st Grade – CCSS for Mathematics

1.NBT.B Understand place value.

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Tier 2	
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1.NBT.B Understand place value.

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Standard Explanation

Grade-one students use base-ten understanding to recognize that the digit in the tens place is more important than the digit in the ones place for determining the size of a two-digit number. Students use models that represent two sets of numbers to compare numbers. Students attend to the number of tens and then, if necessary, to the number of ones. Students may also use math drawings of tens and ones and spoken or written words to compare two numbers. Comparative language includes but is not limited to more than, less than, greater than, most, greatest, least, same as, equal to, and not equal to (MP.2, MP.6, MP.7, MP.8) [adapted from ADE 2010]. (CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.NBT.3 Illustrative Task:

- Comparing Numbers, https://www.illustrativemathematics.org/content-standards/1/NBT/B/3/tasks/1102

Materials
- A spinner with the numbers 0, 1, 2, ... 9
- A spinner with the decades 00, 10, 20, ... 90
- Math journal or teacher-made worksheet
- Pencil

Actions
a. Partner #1 spins the decade spinner and writes the number in the tens place.
b. Partner #1 spins the 0-9 spinner and writes the number in the ones place to make a two-digit number.
c. Partner #2 repeats steps 1 and 2 to make another two-digit number and writes it in their math journal or on the worksheet.
d. Partners decided together whether the first number is greater than, less than, or equal to the second number.
e. Partners write the corresponding symbol (, , =) between the two numbers.
f. Partners repeat until the teacher ends the game.

1st Grade – CCSS for Mathematics

1.NBT.B Understand place value.

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Standard Explanation

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Materials
- A spinner with the numbers 0, 1, 2, ... 9
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- Math journal or teacher-made worksheet
- Pencil

Actions
g. Partner #1 spins the decade spinner and writes the number in the tens place.
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i. Partner #2 repeats steps 1 and 2 to make another two-digit number and writes it in their math journal or on the worksheet.
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1.NBT.C Use place value understanding and properties of operations to add and subtract.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Essential Skills and Concepts:
- ☐ Understanding of two-digit numbers
- ☐ Mentally find ten more or ten less
- ☐ Explain reasoning

Question Stems and Prompts:
- ✓ What is ten more than ______?
- ✓ What is ten less than _______?
- ✓ Explain your reasoning.

Vocabulary	**Spanish Cognates**
Tier 2	
• mentally	mentalmente
• explain	explicar
• reasoning	razonamiento
Tier 3	
• less	
• more	
• two-digit number	

Standards Connections
1.NBT.5 → 2.OA.1

1st Grade – CCSS for Mathematics

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Standards Connections
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1.NBT.C.4

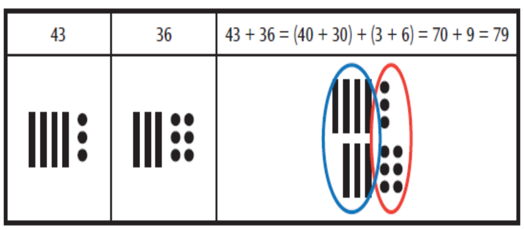
Standard Explanation

Students develop understandings and strategies to add within 100 using visual models to support understanding. In grade one, students focus on developing, discussing, and using efficient, accurate, and generalizable methods to add within 100, and they subtract multiples of 10. Students might also use strategies they invent that are not generalizable.
Students should be exposed to problems that are in and out of context and presented in horizontal and vertical forms. Students solve problems using language associated with proper place value, and they explain and justify their mathematical thinking (MP.2, MP.6, MP.7, MP.8).
Students use various strategies and models for addition. Students relate the strategy to a written method and explain the reasoning used (MP.2, MP.7, MP.8).

The standard algorithm of carrying or borrowing is neither an expectation nor a focus in First Grade.

Examples: Models, Written Methods, and Other Addition Strategies 1.NBT.4▲

1. Solve 43 + 36. Students may total the tens and then the ones. Place-value blocks or other counters support understanding of how to record the written method:



Students circle like units in the drawings and represent the results numerically.

2. Find the sum.

    28
  + 34

Student thinks: *"Counting the ones, I get 10 plus 2 more. I mark the ten with a little one. Adding the tens I had gives me 2 tens plus 3 tens, which is 5 tens. Finally, 5 tens plus 1 more ten is 6 tens, or 60, and 2 more makes 62."*

    28
  + 34
     1
    52
    62

3. Add 45 + 18.
Student thinks: *"Four (4) tens and 1 ten is 5 tens, which is 50. To add the ones, I can make a ten by thinking of 5 as 3 + 2, then the 2 combines with the 8 to make 1 ten. So now I have 6 tens altogether, or 60, and 3 ones left—so the total is 63."*

4. Add 29 + 14.
Student thinks: *"Since 29 is 1 away from 30, I'll just think of it as 30. Since 30 + 14 = 44, I know that the answer is 1 too many, so the answer is 43."*

Adapted from ADE 2010.

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1st Grade – CCSS for Mathematics

1.NBT.C.4

Standard Explanation

Students develop understandings and strategies to add within 100 using visual models to support understanding. In grade one, students focus on developing, discussing, and using efficient, accurate, and generalizable methods to add within 100, and they subtract multiples of 10. Students might also use strategies they invent that are not generalizable.
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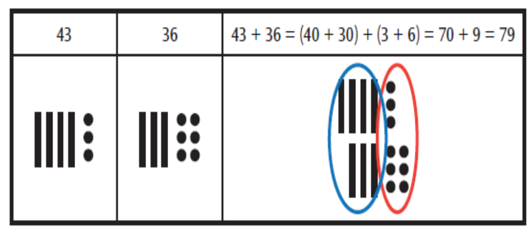


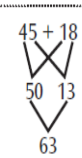
Students circle like units in the drawings and represent the results numerically.

2. Find the sum. 28 + 34

Student thinks: "Counting the ones, I get 10 plus 2 more. I mark the ten with a little one. Adding the tens I had gives me 2 tens plus 3 tens, which is 5 tens. Finally, 5 tens plus 1 more ten is 6 tens, or 60, and 2 more makes 62."

28 + 34, 1, 52, 62

3. Add 45 + 18.
Student thinks: "Four (4) tens and 1 ten is 5 tens, which is 50. To add the ones, I can make a ten by thinking of 5 as 3 + 2, then the 2 combines with the 8 to make 1 ten. So now I have 6 tens altogether, or 60, and 3 ones left—so the total is 63."



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Student thinks: "Since 29 is 1 away from 30, I'll just think of it as 30. Since 30 + 14 = 44, I know that the answer is 1 too many, so the answer is 43."

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(CA Mathematics Framework, adopted Nov. 6, 2013)

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1st Grade – CCSS for Mathematics

1.NBT.C Use place value understanding and properties of operations to add and subtract.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Essential Skills and Concepts:

- ☐ Understanding of two-digit numbers
- ☐ Mentally find ten more or ten less
- ☐ Explain reasoning

Question Stems and Prompts:

- ✓ What is ten more than ______?
- ✓ What is ten less than _______?
- ✓ Explain your reasoning.

Vocabulary	**Spanish Cognates**
Tier 2	
• mentally	mentalmente
• explain	explicar
• reasoning	razonamiento
Tier 3	
• less	
• more	
• two-digit number	

Standards Connections

1.NBT.5 → 2.OA.1

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Standards Connections

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1.NBT.C.5

Standard Explanation

Grade-one students engage in mental calculations, such as mentally finding 10 more or 10 less than a given two-digit number without counting by ones (1.NBT.5). Drawings and place-value cards can illustrate connections between place value and written numbers. Prior use of models (such as connecting cubes, base-ten blocks, and hundreds charts) helps facilitate this understanding. It also helps students see the pattern involved when adding or subtracting 10. For example:

• 10 more than 43 is 53 because 53 is 1 more ten than 43.

• 10 less than 43 is 33 because 33 is 1 ten less than 43.
(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.NBT.5 Example:
There are 74 birds in the park. 10 birds fly away. How many birds are in the park now?
Student A: I thought about a number line. I started at 74. Then, because 10 birds flew away, I took a leap of 10. I landed on 64. So, there are 64 birds left in the park.
Student B: I pictured 7 ten frames and 4 left over in my head. Since 10 birds flew away, I took one of the ten frames away. That left 6 ten frames and 4 left over. So, there are 64 birds left in the park.
Student C: I know that 10 less than 74 is 64. So there are 64 birds in the park.
North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

1.NBT.5 Illustrative Task:

- Number Square, https://www.illustrativemathematics.org/content-standards/1/NBT/C/5/tasks/2106

The teacher explains the Number Square:

- *In this big number square, the numbers in the little individual boxes get bigger by one as we travel to the right.*
- *When we get to the end of a row, the next number is found at the start of the line below.*
- *Notice how the numbers get smaller by one as we travel to the left.*
- *When we get to the beginning of a row, the previous number is found at the end of the line above.*

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

1st Grade – CCSS for Mathematics

1.NBT.C.5

Standard Explanation

Grade-one students engage in mental calculations, such as mentally finding 10 more or 10 less than a given two-digit number without counting by ones (1.NBT.5). Drawings and place-value cards can illustrate connections between place value and written numbers. Prior use of models (such as connecting cubes, base-ten blocks, and hundreds charts) helps facilitate this understanding. It also helps students see the pattern involved when adding or subtracting 10. For example:

• 10 more than 43 is 53 because 53 is 1 more ten than 43.

• 10 less than 43 is 33 because 33 is 1 ten less than 43.
(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1.NBT.5 Example:
There are 74 birds in the park. 10 birds fly away. How many birds are in the park now?
Student A: I thought about a number line. I started at 74. Then, because 10 birds flew away, I took a leap of 10. I landed on 64. So, there are 64 birds left in the park.
Student B: I pictured 7 ten frames and 4 left over in my head. Since 10 birds flew away, I took one of the ten frames away. That left 6 ten frames and 4 left over. So, there are 64 birds left in the park.
Student C: I know that 10 less than 74 is 64. So there are 64 birds in the park.
North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

1.NBT.5 Illustrative Task:

- Number Square, https://www.illustrativemathematics.org/content-standards/1/NBT/C/5/tasks/2106

The teacher explains the Number Square:

- *In this big number square, the numbers in the little individual boxes get bigger by one as we travel to the right.*
- *When we get to the end of a row, the next number is found at the start of the line below.*
- *Notice how the numbers get smaller by one as we travel to the left.*
- *When we get to the beginning of a row, the previous number is found at the end of the line above.*

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

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1.NBT.C Use place value understanding and properties of operations to add and subtract.

1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Essential Skills and Concepts:
- ☐ Subtract multiples of ten from multiples of ten
- ☐ Use concrete models or drawings
- ☐ Understand place value
- ☐ Understand properties of operations
- ☐ Understand the relationship between addition and subtraction

Question Stems and Prompts:
- ✓ Subtract (multiple of ten) from the number ______.
- ✓ Use models or drawings to solve.
- ✓ How do you know that _____ is ten less than ____?
- ✓ Explain your reasoning.

Vocabulary	**Spanish Cognates**
Tier 2	
• put together	
• take apart	
• explain	explicar
• reasoning	razonamiento
Tier 3	
• multiples of ten	múltiplos de diez
• addition	adición
• subtraction	
• model	modelo
• place value	

Standards Connections

1.NBT.5 → 2.OA.1

1st Grade – CCSS for Mathematics

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Standard Explanation

Grade-one students need opportunities to represent numbers that are multiples of 10 (e.g., 90) with models or drawings and to subtract multiples of 10 (e.g., 20) using these representations or strategies based on place value. These opportunities help develop fluency with addition and subtraction facts and reinforce counting on and counting back by tens. As with single-digit numbers, counting back is difficult—so initially, forward methods of counting on by tens should be emphasized rather than counting back.

1.NBT.6 Example:
There are 60 students in the gym. 30 students leave. How many students are still in the gym?
Student A: I used a number line. I started at 60 and moved back 3 jumps of 10 and landed on 30. There are 30 students left. (60 – 10 = 50, 50 – 10 = 40, 40 – 10 = 30)
Student B: 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)
Student C: I thought, "30 and what makes 60?". I know 3 and 3 is 6. So, I thought that 30 and 30 makes 60. There are 30 students still in the gym. (30 + 30 = 60)

North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

1st Grade – CCSS for Mathematics

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1.MD.A Measure lengths indirectly and by iterating length units.

1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

Essential Skills and Concepts:
- ☐ Order three objects by length
- ☐ Compare lengths of two objects indirectly using a third object.

Question Stems and Prompts:
- ✓ Put these objects in order by length.
- ✓ Compare the lengths of these three objects.
- ✓ Which object is the longest?
- ✓ Which object is the shortest?
- ✓ If ______ (object A) is longer than _______ (object B), and _______ (object B) is longer than ______ (object C), how does the length of ______ object A compare to ______ object C?

Vocabulary	**Spanish Cognates**
Tier 2	
• compare	comparar
• order	orden
Tier 3	
• shorter than	
• longer than	
• length	
• equal to	igual a

Standards Connections

1.MD.1 → 1.MD.2

1st Grade – CCSS for Mathematics

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1.MD.1 → 1.MD.2

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1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

Standard Explanation

In grade one, students order three objects by length and compare the lengths of two objects indirectly by using a third object (1MD.1). Students indirectly compare the lengths of two objects by comparing each to a benchmark object of intermediate length. This concept is referred to as *transitivity* (CA *Mathematics Framework*, adopted Nov. 6, 2013).

Examples: Comparing Lengths
Direct Comparisons. Students can place three items in order, according to length: • Three students are ordered by height. • Pencils, crayons, or markers are ordered by length. • Towers built with cubes are ordered from shortest to tallest. • Three students draw line segments and then order the segments from shortest to longest.
Indirect Comparisons. Students make clay "snakes." Given a tower of cubes, each student compares his or 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." Adapted from ADE 2010.

1.MD.1 Example:

Prompt: The snake handler is trying to put the snakes in order- from shortest to longest. She knows that the red snake is longer than the green snake. She also knows that the green snake is longer than the blue snake. What order should she put the snakes?

Student: Ok. I know that the red snake is longer than the green snake and the blue snake because, since it's longer than the green, that means that it's also longer than the blue snake. So the longest snake is the red snake. I also know that the green snake and red snake are both longer than the blue snake. So, the blue snake is the shortest snake. That means that the green snake is the medium sized snake.

North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

1st Grade – CCSS for Mathematics

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1.MD.A Measure lengths indirectly and by iterating length units.

1.MD.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; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

Essential Skills and Concepts:
- ☐ Use a shorter object to measure the length of a longer object.
- ☐ Understand measurement is done with no gaps or overlaps.
- ☐ Record the length of an object as the total number of shorter objects it takes to span the longer object without gaps or overlaps.

Question Stems and Prompts:
- ✓ How many units long is this object?
- ✓ How do you use units to measure the length of this object?

Vocabulary **Spanish Cognates**

Tier 2
- gap
- overlap

Tier 3
- measure
- length
- units of measurement

Standards Connections

1.MD.2 → 2.MD.1

1st Grade – CCSS for Mathematics

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Standard Explanation

Students gain their first experience with measuring length as the iteration of a smaller, uniform length called a length unit. Students learn that measuring the length of an object in this way requires placing length units (manipulatives of the same size) end to end without gaps or overlaps, and then counting the number of units to determine the length. The University of Arizona's Geometric Measurement Progression recommends beginning with actual standard units (e.g., 1-inch cubes or centimeter cubes, referred to as length units) to measure length (UA Progressions Documents 2012c). In order to fully understand the subtlety of using non-standard units, students need to understand relationships between units of measure, a concept that will appear in the curriculum in later grades. Standard 1.MD.2 limits measurement to whole numbers of length, though not all objects will measure to an exact whole unit. Students will need to adjust their answers because of this. For example, if a pencil actually measures between 6 and 7 centimeter cubes long, the students could state the pencil is "about [6 or 7] centimeter cubes long"; they would choose the closer of the two numbers. As students measure objects (1.MD.1–2), they also reinforce counting skills and understandings that are part of the major work at grade one in the Number and Operations in Base Ten domain (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.MD.2 Illustrative Task:

- How Long?, https://www.illustrativemathematics.org/content-standards/1/MD/A/2/tasks/797

Task:
You will need various items to measure, a large set of cubes such as unifix or snap cubes, and a recording sheet with 4 sections. In each section would be the words: _______ cubes long with enough space for a small drawing. The students work in pairs. They choose an item to measure. First they line up the cubes along the longest side of the item. They count and record the number on the first line in the first section. They draw a picture of the item they measured. They continue same routine 3 more times with different items.

1st Grade – CCSS for Mathematics

1.MD.A Measure lengths indirectly and by iterating length units.

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1st Grade – CCSS for Mathematics

1.MD.B Tell and write time.

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

Essential Skills and Concepts:
- ☐ Tell time to the hour and half hour
- ☐ Write time to the hour and half hour
- ☐ Tell and write time using digital and analog clocks

Question Stems and Prompts:
- ✓ What time does the clock show?
- ✓ Write the time shown on the clock.
- ✓ Draw in the hands on the analog clock for ___ o'clock.
- ✓ Draw in the hand on the analog clock for ___ thirty.

Vocabulary	**Spanish Cognates**
Tier 3	
• hour hand	
• minute hand	
• hour	hora
• minute	minuto
• half hour	

Standards Connections
1.MD.3 → 2.MD.7

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Standards Connections
1.MD.3 → 2.MD.7

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1.MD.B Tell and write time.

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

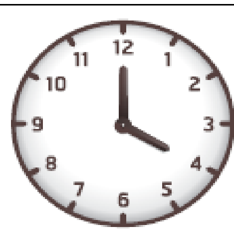
Standard Explanation

Grade-one students understand several concepts related to telling time (1.MD.3), such as:

- Within a day, the hour hand goes around a clock twice (the hand moves only in one direction). A day starts with both hands of the clock pointing up.
- When the hour hand of a clock 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 on a clock 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 when the hour hand is halfway between two hours, 30 minutes have passed.
- A half hour is indicated in written form by using "30" after the colon.

Students need experiences exploring how to tell time in half hours and hours. For example, the clock at left in the following illustration shows that the time is 8:30. The hour hand is between the 8 and 9, but the hour is 8 since it is not yet on the 9 (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.MD.3 Examples:

Examples: Telling Time 1.MD.3	
"The hour hand is halfway between 8 o'clock and 9 o'clock. It is 8:30."	
"It is 4 o'clock because the hour hand points to 4."	

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1st Grade – CCSS for Mathematics

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1st Grade – CCSS for Mathematics

1.MD.C Represent and interpret data.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer 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.

Essential Skills and Concepts:
- ☐ Organize data with up to three categories
- ☐ Represent data with up to three categories
- ☐ Interpret data with up to three categories
- ☐ Ask and answer questions regarding data points

Question Stems and Prompts:
- ✓ How many items in each category?
- ✓ How many more ____ than ____?
- ✓ How many less _____ than _____?
- ✓ Organize this data.
- ✓ Put the categories in order from least to greatest.

Math Vocabulary	**Spanish Cognates**
Tier 2	
• organize	organizar
• represent	representar
• category	categoría
• item	
Tier 3	
• data	datos

Standards Connections
1.MD.4 → 2.MD.10

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Standards Connections
1.MD.4 → 2.MD.10

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1.MD.C Represent and interpret data.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer 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 Explanation

Students can use graphs and charts to organize and represent data (1.MD.4) about things in their lives (e.g., favorite colors, pets, shoe types, and so on). Charts may be constructed by groups of students as well as by individual students. These activities will help prepare students for work in grade two when they draw picture graphs and bar graphs (adapted from ADE 2010; GaDOE 2011; and KATM 2012, 1st Grade Flipbook). When students collect, represent, and interpret data, they reinforce number sense and counting skills. When students ask and answer questions about information in charts or graphs, they sort and compare data. Students use addition and subtraction and comparative language and symbols to interpret graphs and charts (MP.2, MP.3, MP.4, MP.5, MP.6) (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.MD.4 Illustrative Task:

- Favorite Ice Cream Flavor, https://www.illustrativemathematics.org/content-standards/1/MD/C/4/tasks/506

Materials
- Pocket chart
- Sentence strip
- Square pieces of paper for each student
- Popsicle sticks

Setup
Write a question that has three choices as an answer on a sentence strip. For example,
- "Which flavor of ice cream do you like best?"
Put the three categories on the bottom of the pocket chart. For example,
Chocolate Vanilla Strawberry
Write interpretation questions on the popsicle sticks. For example,
- "How many students answered this question?"
- "Which has the most?"
- "Which has the fewest?"
- "Are any the same?"
- "How many are in each category?"

Actions
Begin with all students sitting together in the meeting area. Read the question aloud to the students, and ask individual students to answer the question by putting a paper square above their answer. Ensure that as each child answers, they put their paper above the previous square, not to the side of the square. When each child has answered, you will have a bar graph with three categories.

Draw a popsicle stick and model answering the question to the whole group. Divide students into five groups and have each group pick a popsicle stick. Students then read the question on the popsicle stick, discuss the question as a group, and then answer it in front of the class using the graph as a model to defend their answer.

1st Grade – CCSS for Mathematics

1.MD.C Represent and interpret data.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer 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 Explanation

Students can use graphs and charts to organize and represent data (1.MD.4) about things in their lives (e.g., favorite colors, pets, shoe types, and so on). Charts may be constructed by groups of students as well as by individual students. These activities will help prepare students for work in grade two when they draw picture graphs and bar graphs (adapted from ADE 2010; GaDOE 2011; and KATM 2012, 1st Grade Flipbook). When students collect, represent, and interpret data, they reinforce number sense and counting skills. When students ask and answer questions about information in charts or graphs, they sort and compare data. Students use addition and subtraction and comparative language and symbols to interpret graphs and charts (MP.2, MP.3, MP.4, MP.5, MP.6) (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.MD.4 Illustrative Task:

- Favorite Ice Cream Flavor, https://www.illustrativemathematics.org/content-standards/1/MD/C/4/tasks/506

Materials
- Pocket chart
- Sentence strip
- Square pieces of paper for each student
- Popsicle sticks

Setup
Write a question that has three choices as an answer on a sentence strip. For example,
- "Which flavor of ice cream do you like best?"
Put the three categories on the bottom of the pocket chart. For example,
Chocolate Vanilla Strawberry
Write interpretation questions on the popsicle sticks. For example,
- "How many students answered this question?"
- "Which has the most?"
- "Which has the fewest?"
- "Are any the same?"
- "How many are in each category?"

Actions
Begin with all students sitting together in the meeting area. Read the question aloud to the students, and ask individual students to answer the question by putting a paper square above their answer. Ensure that as each child answers, they put their paper above the previous square, not to the side of the square. When each child has answered, you will have a bar graph with three categories.

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1.G.A Reason with shapes and their attributes.

1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

Essential Skills and Concepts:
- ☐ Identify defining attributes of shapes
- ☐ Identify non-defining attributes of shapes
- ☐ Build and draw shapes to possess defining attributes

Question Stems and Prompts:
- ✓ What are defining attributes of this shape?
- ✓ What are non-defining attributes of this shape?
- ✓ What is the difference between defining and non-defining attributes?
- ✓ Draw/build a shape with ____ sides/angles/faces?

Math Vocabulary	**Spanish Cognates**
Tier 2	
• defining	definición
Tier 3	
• attribute	atributo
• sides	
• vertices	vértices
• angle	ángulo
• face	
• circle	círculo
• rectangle	rectángulo
• square	
• triangle	triángulo
• hexagon	hexágono
• trapezoid	trapezoide

Standards Connections
1.G.1 → 2.G.3

1st Grade – CCSS for Mathematics

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Standard Explanation:

Grade-one students describe and classify shapes by geometric attributes, and they explain why a shape belongs to a given category (e.g., squares, triangles, circles, rectangles, rhombuses, hexagons, and trapezoids). Students differentiate between defining attributes (e.g., "hexagons have six straight sides") and non-defining attributes such as color, overall size, and orientation (MP.1, MP.3, MP.4, MP.7) [adapted from UA Progressions Documents 2012c].

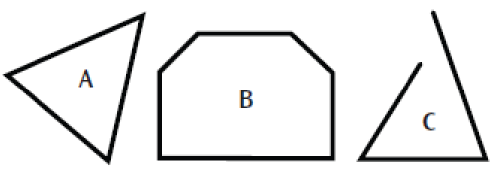
An *attribute* refers to any characteristic of a shape. Students learn to use attribute language to describe two-dimensional shapes (e.g., number of sides, number of vertices/points, straight sides, closed figures). A student might describe a triangle as "right side up" or "red," but students learn these are not defining attributes because they are not relevant to whether a shape is a triangle or not.

Students need opportunities to use appropriate language to describe a given three-dimensional shape (e.g., number of faces, number of vertices/points, and number of edges). For example, a cylinder is a three-dimensional shape that has two circular faces connected by a curved surface (which is not considered a face), but a grade-one student might say, "It looks like a can." Teachers can support learning by defining and using appropriate mathematical terms.

1.G.1 Example:

Using Attributes to Name Shapes 1.G.1

Teacher: "Which figure is a triangle? How do you know?"
Student: "I know that shape A has three sides and the shape is closed up, so it is a triangle. Shape B has too many sides, and shape C has an opening, so it's not closed."



Teacher: "Are both figures presented here squares? Explain how you know."
Student: "I know that a square has 4 sides and that each side has the same length. Even though figure E has a point facing down, it is still a square."

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

1st Grade – CCSS for Mathematics

1.G.A Reason with shapes and their attributes.

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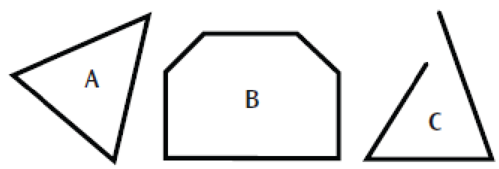

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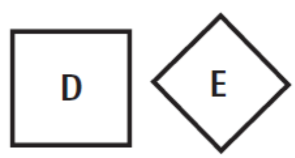

(CA *Mathematics Framework*, adopted Nov. 6, 2013)

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1st Grade – CCSS for Mathematics

1.G.A Reason with shapes and their attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

Essential Skills and Concepts:

- ☐ Identify two-dimensional and three-dimensional shapes.
- ☐ Compose two-dimensional shapes to create a composite shape.
- ☐ Compose three-dimensional shapes to create a composite shape.

Question Stems and Prompts:

- ✓ What different shapes can you make from these shapes?
- ✓ Create a new shape using these shapes.
- ✓ What different shapes can you make using your tangrams?

Math Vocabulary	**Spanish Cognates**
Tier 2	
• identify	identificar
Tier 3	
• compose	componer
• decompose	descomponer
• two-dimensional	bidimensional
• three-dimensional	tridimensional
• circle	círculo
• half-circle	semicírculo
• quarter-circle	quarto de círculo
• rectangle	rectángulo
• square	
• triangle	triángulo
• hexagon	hexágono
• trapezoid	trapezoide
• cube	cubo
• cone	cono
• cylinder	cilindro
• rectangular prism	prisma rectangular

Standards Connections

1.G.2 → 1.G.3

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1.G.2 → 1.G.3

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1.G.A Reason with shapes and their attributes.

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Standard Explanation:

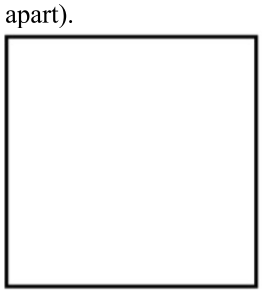
The ability to describe, use, and visualize the effect of composing and decomposing shapes is an important mathematical skill. It is not only relevant to geometry, but also to children’s ability to compose and decompose numbers.

Students may use pattern blocks, plastic shapes, tangrams, or computer environments to make new shapes. Teachers can provide students with cutouts of shapes and ask them to combine the cutouts to make a particular shape. Composing with squares and rectangles and with pairs of right triangles that make squares and rectangles is especially important for future geometric thinking (CA *Mathematics Framework*, adopted Nov. 6, 2013).

1.G.2 Illustrative Task:

- Make Your Own Puzzle, https://www.illustrativemathematics.org/content-standards/1/G/A/2/tasks/756

Give each student scissors, an envelope, and a square of colored paper (the colored paper should be of a wide spectrum to make it easier to keep puzzles apart).



Have the students cut the square into four pieces, then put those pieces in the envelope. The student can then trade puzzles as many times as they like and try to solve each others’ puzzles by reassembling the shapes into a square.

1st Grade – CCSS for Mathematics

1.G.A Reason with shapes and their attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. [Students do not need to learn formal names such as “right rectangular prism.”]

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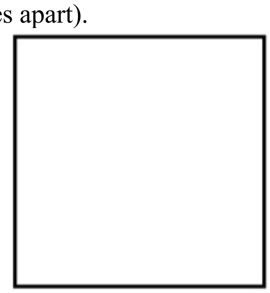

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1st Grade – CCSS for Mathematics

1.G.A Reason with shapes and their attributes.

1.G.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. Understand for these examples that decomposing into more equal shares creates smaller shares.

Essential Skills and Concepts:

- ☐ Partition circles and rectangles into two and four equal shares
- ☐ Understand half, halves, fourths, and quarters
- ☐ Understand partitioning of shapes creates smaller shares of the shape
- ☐ Use the phrases *half of, fourth of, quarter of.*

Question Stems and Prompts:

- ✓ Partition this circle into two/four equal shares.
- ✓ Partition this rectangle into two/four equal shares.
- ✓ How many halves/fourths does it take to make the whole?
- ✓ How do the size of halves/fourths relate to the size of the whole?

Math Vocabulary	**Spanish Cognates**
Tier 2	
• partition	partición
Tier 3	
• equal	igual
• halves	
• fourths	
• quarters	cuartos
• half of	
• fourth of	cuarto de
• quarter of	
• whole	
• decompose	descomponer

Standards Connections

1.G.3 → 2.G.1

1.G.A Reason with shapes and their attributes.

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Standard Explanation:

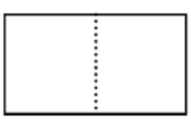
Students need experiences with different-sized circles and rectangles to recognize that when they cut something into two equal pieces, each piece will equal one half of its original whole. Children should recognize that the halves of two different wholes are not necessarily the same size. They should also reason that decomposing equal shares into more equal shares results in smaller equal shares.

As grade-one students partition circles and rectangles into two and four equal shares and use related language (halves, fourths and quarters [1.G.3]), they build understanding of part–whole relationships and are introduced to fractional language. Fraction notation will first be introduced in grade three (CA *Mathematics Framework*, adopted Nov. 6, 2013).

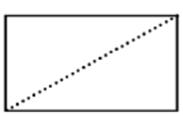
1.G.3 Example:

Prompt
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 split the paper right 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). She gets half of the paper and I get half of the paper. See, if we cut on the line, the parts are the same size.



North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

1st Grade – CCSS for Mathematics

1.G.A Reason with shapes and their attributes.

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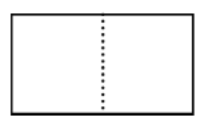

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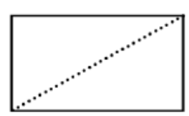

North Carolina Department of Public Instruction, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

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Resources for the CCSS 1st Grade Bookmarks

California *Mathematics Framework,* adopted by the California State Board of Education November 6, 2013, http://www.cde.ca.gov/ci/ma/cf/draft2mathfwchapters.asp

Student Achievement Partners, Achieve the Core http://achievethecore.org/, Focus by Grade Level, http://achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12/page/774/focus-by-grade-level

Common Core Standards Writing Team. Progressions for the Common Core State Standards in Mathematics Tucson, AZ: Institute for Mathematics and Education, University of Arizona (Drafts)

- K, Counting and Cardinality; K – 5 Operations and Algebraic Thinking (2011, May 29)
- K – 5, Number and Operations in Base Ten (2012, April 21)
- K – 3, Categorical Data; Grades 2 – 5, Measurement Data* (2011, June 20)
- K – 5, Geometric Measurement (2012, June 23)
- K – 6, Geometry (2012, June 23)
- Number and Operations – Fractions, 3 – 5 (2013, September 19)

Illustrative Mathematics™ was originally developed at the University of Arizona (2011), nonprofit corporation (2013), Illustrative Tasks, http://www.illustrativemathematics.org/

Student Achievement Partners, Achieve the Core http://achievethecore.org/, Focus by Grade Level, http://achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12/page/774/focus-by-grade-level

North Carolina Department of Public Instruction, Instructional Support Tools for Achieving New Standards, Math Unpacking Standards 2012, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

Common Core Flipbooks 2012, Kansas Association of Teachers of Mathematics (KATM) http://www.katm.org/baker/pages/common-core-resources.php

1st Grade – CCSS for Mathematics

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California Mathematics Framework, adopted by the California State Board of Education November 6, 2013, http://www.cde.ca.gov/ci/ma/cf/draft2mathfwchapters.asp

Student Achievement Partners, Achieve the Core http://achievethecore.org/, Focus by Grade Level, http://achievethecore.org/dashboard/300/search/1/2/0/1/2/3/4/5/6/7/8/9/10/11/12/page/774/focus-by-grade-level

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North Carolina Department of Public Instruction, Instructional Support Tools for Achieving New Standards, Math Unpacking Standards 2012, http://www.ncpublicschools.org/acre/standards/common-core-tools/ - unmath

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Arizona's College and Career Ready Standards – Mathematics – Kindergarten, Arizona Department of Education – High Academic Standards for Students Arizona's College and Career Ready Standards – Mathematics, State Board Approved June 2010 October 2013 Publication, http://www.azed.gov/azccrs/mathstandards/

Howard County Public School System, Elementary Mathematics Office, Standards for Mathematical Practice for Parents, Draft 2011, https://grade3commoncoremath.wikispaces.hcpss.org/file/view/SFMP for Parents.docx/286906254/SFMP for Parents.docx

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