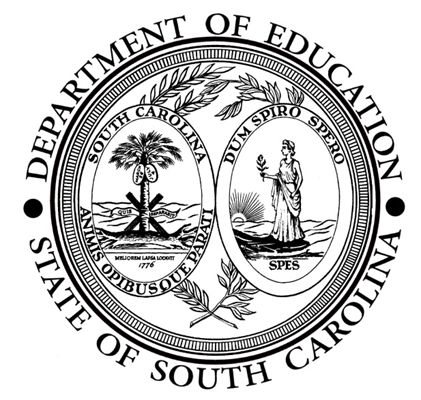
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| South Carolina Department of Education |
| South Carolina College and Career-Ready Standards for Mathematics |
| First Grade Math Support Document |

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| Office of Standards and Learning  July 2020 - DRAFT |



***South Carolina College- and Career-Ready Standards for Mathematics***

**1st Grade Mathematics Support Document**

As support for implementing the *South Carolina College- and Career-Ready Standards for Mathematics*, the standards for each grade K-5 have been grouped into possible units. In the *Table of Contents* below, the titles for those possible units are listed in a column under each grade. To see which standards are addressed in each unit for this grade and to read a brief description of the focus for each unit for this grade, click on the *Overview of Units* in the [*Table of Contents*](#Table_of_Contents). The completed units for this grade are hyperlinked from/to the *Table of Contents* and the *Overview of Units*. The purpose of this document is to provide guidance as to how all the standards at this grade may be grouped into units and how those units might look. Since this document is merely guidance, districts should implement the standards in a manner that addresses the district curriculum and the needs of students.

**Acknowledgments**

The mathematics support documents have been created by teachers for teachers. This is a working document. Based on feedback from classroom application, revisions will continue. During 2019-2020, a team of teachers from 31 districts developed units of instruction. These units are not intended to be a pacing guide. The strategies in the units are not all-inclusive for specific content instruction. Lessons within the units of instruction are not presented in a particular order, but are numbered for ease of reference.

**Mathematical Process Standards:** The South Carolina College- and Career-Ready (SCCCR) Mathematical Process Standards demonstrate the ways in which students develop conceptual understanding of mathematical content and apply mathematical skills. As a result, the SCCCR Mathematical Process Standards should be integrated within the SCCCR Content Standards for Mathematics for each grade level and course. Since the process standards drive the pedagogical component of teaching and serve as the means by which students should demonstrate understanding of the content standards, the process standards must be incorporated as an integral part of overall student expectations when assessing content understanding.

| **Mathematical Process Standards** | |
| --- | --- |
| 1. **Make sense of problems and persevere in solving them.**    1. Relate a problem to prior knowledge.    2. Recognize there may be multiple entry points to a problem and more than one path to a solution.    3. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem.    4. Evaluate the success of an approach to solve a problem and refine it if necessary. | 1. **Use a variety of mathematical tools effectively and strategically.**    1. Select and use appropriate tools when solving a mathematical problem.    2. Use technological tools and other external mathematical resources to explore and deepen understanding of concepts. |
| 1. **Reason both contextually and abstractly.**    1. Make sense of quantities and their relationships in mathematical and real-world situations.    2. Describe a given situation using multiple mathematical representations.    3. Translate among multiple mathematical representations and compare the meanings each representation conveys about the situation.    4. Connect the meaning of mathematical operations to the context of a given situation. | 1. **Communicate mathematically and approach mathematical situations with precision.**    1. Express numerical answers with the degree of precision appropriate for the context of a situation.    2. Represent numbers in an appropriate form according to the context of the situation.    3. Use appropriate and precise mathematical language.    4. Use appropriate units, scales, and labels. |
| 1. **Use critical thinking skills to justify mathematical reasoning and critique the reasoning of others.**    1. Construct and justify a solution to a problem.    2. Compare and discuss the validity of various reasoning strategies.    3. Make conjectures and explore their validity.    4. Reflect on and provide thoughtful responses to the reasoning of others. | 1. **Identify and utilize structure and patterns.**     1. Recognize complex mathematical objects as being composed of more than one simple object.    2. Recognize mathematical repetition in order to make generalizations.    3. Look for structures to interpret meaning and develop solution strategies. |
| 1. **Connect mathematical ideas and real-world situations through modeling.**    1. Identify relevant quantities and develop a model to describe their relationships.    2. Interpret mathematical models in the context of the situation.    3. Make assumptions and estimates to simplify complicated situations.    4. Evaluate the reasonableness of a model and refine if necessary. |  |

|  | overview of units for Grades K-5 | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| K | 1st | 2nd | 3rd | 4th | 5th |
| Unit 1 | Counting and Cardinality | [Composing and Decomposing Numbers Through 10](#First_Unit_One) | Place Value Concepts | Conceptual Understanding of Multiplication & Division | Place Value, Addition, & Subtraction with Whole Numbers | Expressions, Equations, & the Coordinate Plane |
| Unit 2 | Understanding Relationship of Counting and Quantity | [Addition and Subtraction Strategies](#First_Unit_Two) | Developing Concepts of Addition and Subtraction | Place Value | Algebraic Thinking | Place Value |
| Unit 3 | Count and Compare | [Understanding Place Value](#First_Unit_Three) | Application of Addition and Subtraction | Addition & Subtraction | Multiplication & Division of Whole Numbers | Operations with Whole and Decimal Numbers |
| Unit 4 | Composing and Decomposing Numbers | [Applying Place Value Concepts](#First_Unit_Four) | Attributes of Polygons and Fractional Parts | Application of  Multiplication & Division | Fraction Equivalence | Adding and Subtracting Fractions |
| Unit 5 | Understanding Measurement and Data | [Comparisons and Data](#First_Unit_Five) | Measurement: Length | Conceptual Understanding of Fractions | Adding, Subtracting, & Multiplying with Fractions | Multiplying with Fractions |
| Unit 6 | Patterns and Positions | [Geometry and Equal Shares](#First_Unit_Six) | Measurement Time and Money | Data Analysis | Decimal Concepts | Dividing with Fractions |
| Unit 7 | Two Dimensional and Three Dimensional Geometry | [Measurement, Time and Money](#First_Unit_Seven) | Creating and Understanding Data | Identification and Classification of Geometric Shapes | Conversions & Problem Solving with Measurement | Classifying 2D Shapes |
| Unit 8 | Addition and Subtraction |  |  | Problem Solving with Measurement | Geometric Classifications & Line Symmetry | Perimeter, Area, and Volume |
| Unit 9 |  |  |  | Fluency with Multiplication & Division | Angle Measurement | Converting Measurements within a Single System |

**Grade One Table of Content**  
*Click here to return to the* [*K-5 Overview of Units*](#Table_of_Contents)

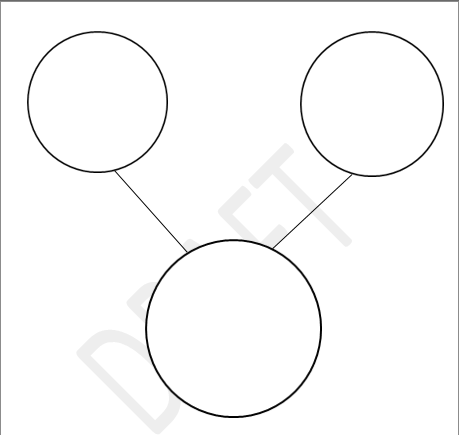
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| --- | --- | --- | --- |
| **Unit 1**  Page 7 | **Unit 2**  Page 31 | **Unit 3**  Page 51 | **Unit 4**  Page 72 |
| [**Composing & Decomposing Numbers through 10**](#First_Unit_One) | **[Addition and Subtraction](#First_Unit_Two)**  **[Strategies](#First_Unit_Two)** | **[Understanding](#First_Unit_Three)**  **[Place Value](#First_Unit_Three)** | [**Applying Place Value Concepts**](#First_Unit_Four) |
| **Standards** | **Standards** | **Standards** | **Standards** |
| 1.ATO.1  1.ATO.3  1.ATO.5  1.ATO.6  1.ATO.9.b  1.NSBT.1.a | 1.ATO.1  1.ATO.2  1.ATO.3  1.ATO.4  1.ATO.6  1.ATO.7  1.ATO.8  1.NSBT.1.(a,c,d) | 1.NSBT.1  1.NSBT.2  1.NSBT.3  1.NSBT.5 1.ATO.3  1.ATO.5  1. ATO.6.  1.ATO.8 | 1.NSBT.4  1.NSBT.6  1.ATO.1  1.ATO.2  1.ATO.3  1.ATO.5  1.ATO.6  1.ATO.8 |
| **Unit Focus** | **Unit Focus** | **Unit Focus** | **Unit Focus** |
| *Unit 1* will focus on number concepts and relations by composing and decomposing numbers through 10.  Students will develop a beginning understanding of addition and subtraction. | *Unit 2* will focus on representing, solving, and exploring addition and subtraction. Students will extend their understanding of addition and subtraction from *Unit 1* to developing strategies for adding and subtracting whole numbers through 20.   Students will have an understanding of subtraction as an unknown addend problem and determine missing numbers in addition and subtraction equations within 20 using a variety of strategies. | *Unit 3* will focus on developing an understanding of whole number relationships and place value through 99, including “making a ten”. Students will develop an understanding of the relative magnitude of numbers by comparing two-digit numbers based on the meanings of the tens and ones. They will use that number sense to solve problems. | *Unit 4* will focus on students developing, discussing, and using efficient, accurate, and generalizable methods to add within 99 and to subtract multiples of 10. |
| [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit1)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U1)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U1)  [Instructional Resources](#Instructional_Resources_U1) | [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit2)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U2)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U2)  [Instructional Resources](#Instructional_Resources_U2) | [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit3)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U3)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U3)  [Instructional Resources](#Instructional_Resources_U3) | [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit4)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U4)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U4)  [Instructional Resources](#Instructional_Resources_U4) |
| Math Task | Math Task | Math Task | Math Task |
| [Hula Hoop Part-Part Whole](#Math_Task_Hula_Hoop)  [Patterns of Counting](#Math_Task_Patterns_of_Counting) | [Using Number Sense to Represent Numbers in Multiple Ways](#Math_Task_Using_Number_Sense)  [Addition and Subtraction with Number Bonds](#Math_Task_Addition_and_Subtraction_with_)  [Adding Three Addends](#Math_Task_Adding_Three_Addends) | [Counting by Fives and Tens Starting at Any Number](#Math_Task_Counting_by_Fives_Tens)  [Solving for Missing Number in Addition and Subtraction Through 20](#Math_Task_Solving_for_Missing_Number)  [Making Bundles of 10](#Math_Task_Making_Bundles_of_10)  [Place Value Collage](#Math_Task_Place_Value_Collage) | [Addition and Subtracting Multiples of 10 with 120 Chart](#Math_Task_Add_Sub_with_10)  [Domino Addition with Regrouping](#Math_Task_Domino_Addition_with_Regroupin) |

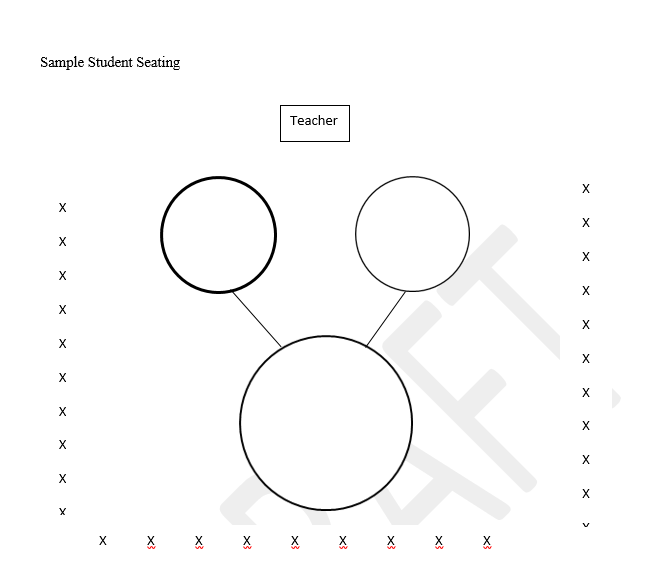
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| --- | --- | --- |
| **Unit 5**  Page 83 | **Unit 6**  Page 93 | **Unit 7**  Page 109 |
| **[Comparisons](#Comparisons_and_Data)**  **[and Data](#Comparisons_and_Data)** | [**Geometry and Equal Shares**](#Geometry_and_Equal_Shares) | [**Measurement, Time and Money**](#Measurement_Time_and_Money) |
| **Standards** | **Standards** | **Standards** |
| 1.MDA.4  1.MDA.5  1.ATO.1  1.ATO.2  1.ATO.9.b | 1.G.1  1.G.2  1.G.3  1.G.4  1.ATO.9 | 1.MDA.1  1.MDA.2  1.MDA.3  1.MDA.6 |
| **Unit Focus** | **Unit Focus** | **Unit Focus** |
| *Unit* 5 will build on the K concepts of sorting and classifying by collecting, organizing and representing data with up to 3 categories using object graphs, picture graphs, t-charts, and tallies. Students will ask/answer questions and draw conclusions based on given graphs (object graphs, picture graphs, t-charts, tallies, bar graphs). Building on Unit 3 comparison knowledge, students will develop comparison statements for a set of data and draw and solve comparison problems. | *Unit 6* will focus on students identifying, naming, partitioning, and reasoning about attributes of two-dimensional and three-dimensional shapes.  Students will compose and decompose plane or solid figures (e.g., combine two triangles to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. | *Unit 7* will focus on an understanding of the meaning and processes of measurement, including an understanding of linear measurement as iterating length units.  Students will work with both analog and digital clocks as they tell and record time to the nearest hour and half hour.  Students will also identify coins and their values. |
| [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit5)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U5)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U5)  [Instructional Resources](#Instructional_Resources_U5) | [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit6)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U6)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U6)  [Instructional Resources](#Instructional_Resources_U6) | [New Academic Vocabulary for This Unit](#New_Academic_Vocabulary_Unit7)  [Content Standards with Clarifying Notes](#Content_Standards_with_Notes_U7)  [Relationship Among Standards in This Unit](#Relationship_Among_Standards_U7)  [Instructional Resources](#Instructional_Resources_U7) |
| Math Tasks | Math Task | Math Task |
| [Graphing and Data](#Math_Task_Graphing_with_Data)  [Comparing Problems](#Math_Task_Comparing_Problems)  [Growing Patterns](#Math_Task_Growing_Patterns) | [Let’s Match and Sort Shapes](#Math_Task_Lets_Match_and_Sort)!  [Filling Shapes with More or Less](#Math_Task_Filling_Shapes_with_More_Less)  [Be Fair and Share](#Math_Task_Be_Fair_and_Share)  [Repeating Patterns](#Math_Task_Repeating_Patterns) | [Measuring with Nonstandard Units](#Math_Task_Add_Measuring_with_Nonstandard)  [Telling And Recording Time to the Hour and Half Hour](#Math_Task_Telling_and_Recording_Time)  [What’s Missing (Coins)](#Math_Task_Whats_Missing_Coins) |

| **1st Grade Math Unit 1**  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- |
| **Composing and Decomposing Numbers Through 10** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.ATO.6** Demonstrate:  1. addition and subtraction through 20; 2. fluency with addition and related subtraction facts through 10.    * + Students should use strategies such as counting on, making 10, decomposing a number leading to a 10, using the relationship between addition and subtraction, creating equivalent but easier or known sums, doubles plus or minus one, counting back, and the commutative property. Understand the role of 0 in addition and subtraction. Fluency is defined as efficient, accurate, and flexible. Phases of operational understanding: construct operational meaning, develop reasoning strategies, and work toward quick recall.      + Teacher Note: The NCTM Principles and Standards for School Mathematics defines **computational fluency** as having efficient, flexible, and accurate methods for computing. Computation fluency of “mathematical fluency” with whole numbers is an essential guide for school mathematics and forms the foundation for many higher level math concepts.  * **1.ATO.5** Recognize how counting relates to addition and subtraction.   + Teachers will need to assist students in developing the relationship between counting and the operations of addition and subtraction. For example, skip counting forward or backward by 10. The teacher could use skip counting or counting on. May want to define counting on. The concept of missing addend may be used for subtraction. (Related to CC.1.OA.5 and CC1.NBT.6)   + Teacher Note: Use number lines as a visual of the number sequence. * **1.ATO.9** Create, extend, and explain using pictures and words for:  1. Repeating patterns (e.g., AB, AAB, ABB, and ABC type patterns); 2. Growing Patterns (between 2 and 3 terms/figures)    * + Teacher Note: Patterns can be found in physical and geometric situations as well as in numbers. Introduction to recognizing linear patterns through looking at the number sequence. A plus 1 growing pattern is found through decomposing numbers to find the combinations within.  * **1.NSBT.1** Extend the number sequence to:   a. count forward by ones to 120 starting at any number;  b. count by fives and tens to 100, starting at any number;  c. read, write and represent numbers to 100 using concrete models, standard form, and equations in expanded form;  d. read and write in word form numbers zero through nineteen, and multiples of ten through ninety.   * + - Individually and in sequence     - One purpose for counting by groups (“unitizing”) is to make counting more efficient.     - Teacher Note: Standard to be thought of as ongoing. Start with number sequence through 10 within Unit 1 * **1.ATO.1** Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions.   + Students should use spoken words, concrete objects, drawings such as tape diagrams, pictorial models, length-based models (i.e., connecting cubes), number lines, and number sentences to solve story problems involving strategies of adding to, taking from, putting together, taking apart, and comparing, with the unknown as any one of the terms . In the problem such as 2 + 4 = []; 3 + [] = 7; and 5 = [] -3. Students may use a variety of basic fact strategies such as composing a 10 and decomposing a number leading to 10. Students should explain the problem-solving strategy with spoken words, concrete objects, pictorial models, and number sentences.   + Addition and subtraction have been separated into four categories; join problems, part-part-whole problems, separate problems, and compare problems. Each category has three numbers, and any one of the three numbers can be the unknown in a story problem.   + Teacher Note: **Joining** action-involves three quantities; an initial amount, a change amount (the part being added or joined), and the resulting amount (the amount after the action is over). **Part-Part-Whole** action-involves two parts that are combined into one whole. There is no meaningful distinction between the two parts within a part-part-whole situation, so there is no need to have a different problem for each parts as the unknown. **Separation action** involves three quantities; the initial amount as the whole or the largest amount, a change, and result amounts. **Compare problems** involve the comparison of two quantities, and the third amount is the difference between the two amounts. (Adapted from Van de Walle)   + Teacher Note: Unit 1 provides an introduction to the concepts within this standard. * **1.ATO.3** Apply Commutative and Associative Properties of Addition to find the sum (through 20) of two or three addends.   + Students should use concrete, pictorial, and verbal representations of the commutative property and associative property of addition when solving. It is not important that students know the property name, but the concept the property provides.   + Teacher Note: This standard focuses primarily on *understanding* the properties to find sums (through 10) of two addends. |
| **New Academic Vocabulary for This Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * 5-group * extras * break apart * decompose * symbol * combinations * partners | * partner houses * switch the partners * addend * set * pair * doubles * equal | * sum * equal to * equation * number sentence * expression * plus sign * plus | * plus 1, plus 2 * minus * take-away * decrease * counting on * counting all * counting back | * fact * compare * fewer * less than * more than * greater * represent | |
| **Prior Knowledge Required for This Unit** |
| Students should be able to count groups of objects; telling how many in all (cardinality) and have an understanding of one-to-one correspondence. In Kindergarten students are introduced to the concepts of addition and subtraction and begin developing an understanding through modeling situations within 10 using objects, fingers, mental images, drawings, acting out situations, verbal explanations, expressions, and equations. Fluency within 5 was expected at the Kindergarten level. |
| **Subsequent Knowledge Related to This Unit** |
| In Grade 1, students begin to develop an understanding of place value as working with numbers to 10 continues from Kindergarten. Repeated Kindergarten experiences in Unit 1 extends the conceptual algebraic thinking bridging an understanding of subtraction as an unknown addend problem and determining missing numbers in addition and subtraction equations within 20 required in Unit 2. It takes time for children to build understanding of such problems, but this is crucial, and they need to see them for each number through 10. Later in Unit 2, students will extend their thinking to using strategies for adding and subtracting.  In Unit 1, students begin developing a deeper understanding of the concepts of addition and subtraction begun in Kindergarten. Through a variety of meaningful and engaging experiences, students develop an understanding of the number combinations working towards mastery of understanding the meaning of addition and subtraction and applying operations to solve problems in context.  Understanding the operations is essential, as well as understanding number concepts and relations. Decomposing and composing numbers to ten builds a foundation towards understanding number concepts and relations. At first children find the partner combinations embedded within one-digit numbers. Then in Unit 2 students build on understanding the partner combinations embedded within one-digit numbers, and begin to apply Commutative and Associative Properties of Addition to find the sum (through 20 ) of two addends.  Students will continue to apply the properties of addition to find the sum (through 20) in Units 2 and 4. Once students are able to understand and apply place value concepts, applying the Commutative and Associative Properties of Addition to find and the sum (through 20) with 3 addends will progress later on in Units 2 and 4 as well.  Once students have a foundational understanding of numbers and operations, Unit 3 moves on to understanding place value, finding the tens and ones in two-digit numbers. Students should progress quickly from subitizing and unit counting in kindergarten to visualizing numbers in groups of 5 and 10. Visualizing quantities in groups of 5s and 10s prepares children to understand place value and helps them with mental computation which comes later in second grade.  It is essential for students to understand the operations before beginning to practice any math fact fluency. Unit 1 spends time breaking whole numbers apart into combinations working towards automaticity with math facts. As students progress to Unit 2 they will begin to apply strategies and are then ready to begin to commit those facts to memory later in second grade.  *Teacher note: Commutative and Associative Properties of Addition to find the sum (through 20) of two or three addends is taught and applied in first grade. Second grade expectations are for students to use the properties to add and subtract within 99 fluently.* |
| **Relationship Among Standards in This Unit** |
| The various indicators in the unit were combined to develop number concepts and understanding the operations of addition and subtraction through decomposing and composing numbers through 10. The standards in Unit 1 relate to the key concept Algebraic Thinking and Operations. The standards included in first grade are the ultimate goal for students to master by the end of the year. Units 1-2 set the foundation for understanding and applying place value concepts in Units 3 and 4. Within standard 1.ATO.1, Unit 1 will focus on understanding number concepts and relations as a foundation towards solving real-world story problems using addition and subtraction through *10.*  Unit 1 focuses on the 1-more and 1-less pattern, first with counting numbers, then with finding partners, and finally with addition and subtraction. Students in first grade are working with some of the same number concepts and operations within 10 from Kindergarten. However, in first grade they are progressing from modeling situations to solving and representing equations. Basic fact instruction for fluency begins with conceptual understanding and many opportunities to develop strategic thinking. Understanding the relationship between the operations; addition, and subtraction, is critical. A variety of practice methods build automaticity and quick recall. The foundation for conceptual understanding begins in Unit 1. The standards are intertwined within each other, students will develop an understanding of the 1-more and 1-less pattern first with counting numbers, then with finding partners, and finally with addition and subtraction computations.  As students decompose and compose numbers through 10, direct their focus on thinking about a number as a whole, with partners that form combinations within. When students find all possible combinations of numbers through 10, (e.g., 5 has 4 sets of combinations, 4+1, 3+2, 2+3, 1+4), they begin recognizing how counting relates to addition and subtraction (1.ATO.5), and then will begin to develop an understanding of how to apply that knowledge and use strategies to solving real-world/story problems using addition (*as a joining action* and as a *part-part-whole action*) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions (1.ATO.1 ). The exploration of patterns and properties guides students towards demonstrating fluency with addition and related subtraction facts through 10. (1.ATO.6)  Students will discuss patterns as decomposition equations are recorded. Patterns across the decompositions will be recognized as well as recognizing growing patterns within the number sequence (Introduction to 1.ATO.9.b). Our Base Ten numeral system is a system of patterns, and these patterns become visible throughout the exploration of addition and subtraction facts. Math facts are predictable because of these patterns.  ***Teacher Note:*** “Once students understand that our number system is a system of patterns, they begin to recognize patterns in math facts that will help them make sense of, and remember, the facts. Noticing patterns that emerge when observing the equations 6+4=10, 7+3=10, and 9+1=10 will lead to some interesting discussions as students attempt to explain their observations.” *(Mastering the Basic Math Facts in Addition and Subtraction p. 16)*.  ***Teacher Note:*** Numeric patterns are addressed when looking at the number sequence, understanding that when counting by ones the next number in the sequence is one more each time (plus 1), and when counting backwards by ones the next number in the sequence is one less each time (minus 1). ***Teacher Note:***  The number of combinations a whole number has is 1 less than the whole number. Knowing and understanding that concept will help students independently discover all combinations for a given whole number. For example the whole number 2 has 1 combination (1+1), the whole number 3 has 2 combinations (1+2, 2+1), the whole number 4 has 3 combinations (1+3, 2+2, 3+1). The number zero is to be thought of as a known partner which it’s not included within the combinations. |
| Through the continuous exploration of decomposing numbers, number combinations (facts) can be found within a given number (fact families). Once students are able to decompose and compose numbers, then their understanding extends to being able to see the parts of a whole and then they are able to think about the four categories and the three numbers within to understand strategies for finding unknowns in a story problem.  For example, if I know that 6 = 2 + 4, then I can use that to solve the following problem: 6 – 4 = [].  It is essential to spend time manipulating and representing numbers, and solving simple problems in which students gain a strong foundation of number sense. Having number sense and understanding numbers in the early years involves the understanding of quantity, comparing quantities, fluency and flexibility with counting, and the ability to perform simple operations with numbers. Students need to explore numbers, in a variety of ways, with a variety of materials.  Learning experiences should take students from world experiences, to concrete materials, then to visual (and other) representations, before expecting abstract representations.  Students need to see and use equations in many forms. When children are comfortable representing quantities, encourage them to begin creating stories about the groupings. Encourage students to create story problems as well as solve story problems presented orally. (e.g., When decomposing numbers the teacher and students can present the task as a story problem; There were 7 children in the library. 6 children were reading. How many were writing? Students can also tell stories about the number combinations and equations. (e.g., There are \_\_ \_\_ apples in the basket. \_\_ are green and \_\_ are red.)  Over time students will become comfortable and flexible with mathematical language and can connect concepts and terminology with meaningful referents from their own lives.  Modeling the use of simple real-world story problems within instruction from the beginning will scaffold students’ thinking to making connections within the operations as well.   | **Create a mathematical classroom which encourages collaboration and builds community. A suggestion for developing World Class Skills a South Carolina student needs to be college and career ready is to:**  Provide settings within the mathematical classroom that promotes the use of ***Math Talk:***   * Frequently exchange mathematical ideas and problem solving strategies. * Children listen to understand one another. This involves thinking about what a person is saying so that you can explain it yourself or to help them explain it more clearly. It is not just being quiet when someone else is talking. Also, children need to listen so that they can ask a question or help the explainer. * Encourages critical thinking and problem solving, collaboration and teamwork, and knowing how to learn * Teachers can stand back or to the side of the classroom to encourage Math Talk as students interact more directly with each other. * Most common structures:   + Solve and Discuss: 4 to 5 students solve, explain, question, and justify at the board, while the rest of the class works the problems at their seats. 2-3 students are teacher selected to explain their methods.   + Solve and Discuss Small Group version: *(after whole group discussion has taken place)* Students solve a problem individually within a small group. 2-3 students explain their method and solution to the rest of the group while the others are encouraged to ask questions for clarification.   + Student Pairs and Helping Pairs: Two students work together, learning from each other, particularly in applying and practicing concepts introduced in whole-class discussion. Helping pairs-More advanced students are matched with students who are struggling.   + Scenarios- Students act out a particular mathematical situation   + Small Groups: Students work in groups | | --- |   **Discuss Numbers 1-10** *(adapted from Math Expressions)*  **Lesson Focus:** Visualize and represent numbers 1-10  **Objectives:**  The students will understand the 1-more and 1-less pattern by using *Stair Steps* to show 1-more and 1-less sequences for numbers 1-10. The students will visualize and represent numbers as a group of 5 and extra ones using perceptual and conceptual subitizing.  **Materials:**   * ‘Stair-Steps’. Each student will need a printed copy of the ‘Stair Steps’ on page 3 from the resource below:   **Stair Steps:**  <https://www-k6.thinkcentral.com/content/hsp/math/hspmathmx/na/gr1/ete_9780547838717_/resource.html?Unit=1&Less=1&Type=Copymaster>  Teacher Note: When cutting out the Stair-Steps, cut along the dashed lines, and NOT the solid lines. Whole Group:  1. **Discuss Stair Steps**    * Introduce Stair-Steps as a ‘math tool’ that will be used to help them learn about numbers 1 through 10.    * Ask for Ideas: Invite children to discuss what Stair Steps might be and how they could used to learn about number.    * Provide each child with a set of Stair Steps. Allow a few minutes for student exploration.    * The teacher should observe how children arrange their set of steps.    * Ask children to share what they notice about the Stair Steps.  Sequentially Arrange the Stair Steps  * + Ask children to find Stair Step 1 and place it at the top of their work space. Then have them place Stair Step 2 under it, followed by Stair Step 3 and so forth.   + Question Children as they work. (What do you notice about the Stair Steps? How are you lining them up? Are you making steps?)   + Once the sequence is complete, guide children in reciting the 1-more sequence as they touch each step     - 1 and 1 more is\_\_. 2     - 2 and 1 more is\_\_. 3     - 3 and 1 more is\_\_, and so on. 4   + Then recite the sequence in reverse as they touch each step.     - 1 less than 10 is\_\_. 9     - 1 less than 9 is\_\_. 8     - 1 less than 8 is\_\_, and so on. 7  1. **See quantities as 5-groups: Use a 5-group and extra ones**    * Ask children to find Stair Step 5 and center it on their workspace. Then have them put Stair Step 1 underneath. Help students express the total number of dots.      + 5 and 1 more is\_\_. 6    * Then replace Stair Step 1 with Stair Step 2 and tell how many.      + 5 and 2 more is \_\_\_. 7    * Then replace Stair Step 2 with Stair Step 3 and tell how many.      + 5 and 3 more is \_\_\_. 8    * Then replace Stair Step 3 with Stair Step 4 and tell how many.      + 5 and 4 more is \_\_\_. 9 2. **Represent the 5-Group**    * The teacher will use the finger rhyme, ”Five Crows in a Row,” to illustrate the 5-group and the extra ones in numbers 6 through 10. Children show the “crows” with their fingers and respond with the total.      + The teacher shows 5 fingers on one hand and 2 fingers on the other hand and says the rhyme. The children each put up the same number of fingers and respond with the total. The teacher repeats the activity moving to 2 below, 3 below, and so on. Then try the numbers in random order. *For the first time the teacher should lead the activity but once students are familiar with the rhyme, you may want to invite a few children to act as Student Leaders.*      + **Five Crows in a Row Rhyme:**   How many crows? 6 crows   * + - Teacher Note: The ability to form quick mental pictures of quantities by grouping the units is crucial to performing mathematical operations efficiently. Children benefit greatly from learning of visualize numbers without counting individual units. Visualizing numbers without counting is called perceptual subitizing. Perceptual subitizing develops into conceptual subitizing when children visualize two numbers and combine their value to find the total. Visualizing quantities in groups of fives and extra ones.  1. **Informal Assessment: Student Summary**    * Ask children to use Stair Steps to show 9 as a 5-group and extra ones. Then have them use words to describe their arrangement. Responses should include that 5 and 4 more is 9.      + Teacher Note: Students can record their responses in a Math Journal.   **Daily Activity: Number of the Day Stretch:**   * [https://books.google.com/books?id=vQDOAwAAQBAJ&pg=PA39&lpg=PA39&dq=number+of+the+day+stretch&source=bl&ots=wkvMTBeu4R&sig=\_YRGevESgrcZxoUPND6j74xDIS4&hl=en&sa=X&ved=0CB8Q6AEwAGoVChMI77DK\_76UxgIVg5WACh1nfACx#v=onepage&q=number% 20of%20the%20day%20stretch&f=false](https://books.google.com/books?id=vQDOAwAAQBAJ&amp;pg=PA39&amp;lpg=PA39&amp;dq=number%2Bof%2Bthe%2Bday%2Bstretch&amp;source=bl&amp;ots=wkvMTBeu4R&amp;sig=_YRGevESgrcZxoUPND6j74xDIS4&amp;hl=en&amp;sa=X&amp;ved=0CB8Q6AEwAGoVChMI77DK_76UxgIVg5WACh1nfACx%23v%3Donepage&amp;q=number%20of%20the%20day%20stretch&amp;f=false)   **Activity: Representing Partners: Break-Apart and Partners of a Number:**  Objective: Building Number Concepts   * Children can break apart numbers using a ‘Break-Apart’ stick such as a pencil or a coffee stirrer. Children can use objects to represent numbers (e.g., color tiles or plastic counters). Children begin to learn about the embeddedness of numbers by breaking them into smaller components. Understanding how numbers can be broken apart (decomposed) and put back together (composed) helps build a foundation for understanding addition and subtraction.   + Teacher Note: As students decompose a given number, the teacher can write each decomposition with an equation such as 5=4+1, showing the total on the left and the two addends on the right. Record the equations in sequential order. Students can find patterns in all of the decompositions of a given number and eventually summarize the patterns for several numbers. (Adapted from *Progressions for the CCSS on Operations and Algebraic Thinking*)   **Activity: Building Partners with Cubes**   * Have students use the total number of cubes of one color to build a cube-train. Then have them replace one cube of the train with a cube of another color and record the partners. Continue replacing one cube at a time and recording the partners. * Teacher Note: Tactile learners may benefit from using connecting cubes to find the sets of patterns for a given total. * Teacher Note: Algebra: *Switching the partners* involves changing the order of the partners, or addends, within combinations embedded in a number. When the partners switch places, the total stays the same. This switching of partners demonstrate the Commutative Property of Addition.   **Lesson: Sample mini-lesson for Breaking Numbers Apart:**  <http://www.mathsolutions.com/documents/0-941355-74-8_L.pdf>   * This sample lesson offers two versions of an activity that focuses students on breaking numbers apart (decomposing), one version for kindergarten and first-grade students and another for second graders. Refer to *From a Kindergarten and First Grade Classroom.* * The activity gives students an opportunity to reason numerically, and write addition equations. Variations and modifications should be taken into consideration based on individual student needs.   **Lesson:**  [Engage NY Grade 1 Topic 1](https://www.engageny.org/resource/grade-1-mathematics-module-1-topic-lesson-1)   * **Lesson Objective:** Analyze and describe embedded numbers (to 10) using 5-groups and number bonds.   **Lesson: Grade 1 Module 1: Sums and Differences to 10: 1.ATO.1, 1.ATO.5, 1.ATO.6,**   * <https://www.engageny.org/resource/grade-1-mathematics-module-1-topic-c> * “In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 as they are presented with opportunities intended to advance them from counting all to counting on which leads many students then to decomposing and composing addends and total amounts.” * Refer to Lessons 1-8 within Module 1; Lessons 9-39 can be used in Unit 2   **Video: Visualizing Number combinations:**  <https://www.teachingchannel.org/videos/visualizing-number-combinations>   * This video is of a modeled Kindergarten lesson for using quick images to identify combinations of 8. * This lesson can be modified for first grade students as a visual way for seeing combinations and that numbers can be seen in a variety of combinations.   **Task: Making a Ten:**  <https://www.illustrativemathematics.org/content-standards/1/OA/C/6/tasks/1169>   * This task is designed to help students visualize where the 10's are on a single digit addition table and explain why this is so.   **Culminating Lesson:**  **Use Patterns to add and subtract within 10** *(adapted from Math Expressions)*  **Lesson Focus:** Add and subtract within 1-10  **Objectives:**  The students will discuss patterns with number partners.  The students will use patterns to add and subtract within 10.  The students will understand the role of 0 in addition and subtraction.  **Materials:**   * chart paper (1 large piece or 2 small pieces) * markers * Premade chart showing “Patterns with Zero” * Premade chart showing “Patterns with Doubles”   **Whole Group**   1. **Patterns in Partners from 2 to 10.**  * As a review, create a chart showing the patterns with partners. The teacher will write the total at the student and ask for volunteers to tell you the partners for each whole number as you record the combinations on the chart. Refer to the image, Patterns with Partners, above for how the chart should look. * Discuss the patterns observed. Include the following in the discussion:   + The top row is the Plus 1 partners. Plus 1 partners go with the number just before the total.   + We have doubles within 10: 1+1, 2+2, 3+3, 4+4, and 5+5.   + You can make the partners of 10 from the partners of 9 by adding 1 to the first partners for 9: 8+1 becomes 9+1, 7+2 becomes 8+2, 6+3 becomes 7+3, and 5+4 becomes 6+4. Then there is the new double 5+5. * Generalize: Then guide children to generalize that you can make the partners for a new number from the partners for the number just before by adding 1 to the first partner. Remind children they need to determine if the new number also has partners that are doubles.   **2. Patterns with Zero:**   * Using the chart “Patterns with Zero” discuss the patterns. Tell children to look at the first column of equations in the chart, and tell how all the equations are the same. *(They all add zero, which is not things at all*). * Ask children to tell a story about 10+0 and then tell the answer. * Encourage children to tell what the general pattern is for adding 0 to a number. *(The answer is the number that is not zero. That number does not change because you did not add anything to it.)* * Now look at the second column and ask, “How are all these equations the same?” *(They all subtract zero, which is no things at all)* * Ask children to tell a story about 10-0 and then tell the answer. * Ask, “What is the general pattern for subtracting a 0 from a number? *(The answer is the number that is not zero. That number does not change because you did not subtract anything from it.* * Then look at the third column and tell how the equations are the same. *(They all subtract a number from itself, which leave zero because you took away all of the things.)* * Ask children to tell a story about 10-10 and then tell the answer. * Ask, “What is the general pattern for subtracting a number from itself?” *(The answer is 0.)*   **3. Partner Work:**   * Encourage students to discuss the equations in the Patterns with Doubles chart with a partner. Encourage them to share their observations and any connections they make with the Patterns with Partners chart.   **4. Assessment Task:** *1.ATO.1, 1.ATO.3, 1.ATO.5, 1.ATO.6*   * Ask students to solve the following problem:   *Student A is filing a bowl with apples and oranges. Student A puts 5 apples and 5 oranges in the bowl. Is there another way to fill the bowl with apples and oranges and have exactly 10 pieces of fruit in it? (Yes or No) Explain your answer. Write number sentences to show your thinking.*   * Teacher Note: Questions to think about as students problem solve. Are students able to determine all of the ways in which two number can be combined by addition to give a sum of 10? To what extent do they apply understanding of quantity, part-part-whole relationship, and compensation. To what extent do they represent sums of ten by writing number sentences or combinations. |
| **Instructional Resources** |
| Teacher Resources:   * **Three Printable Tens Frames:**   + [https://illustrativemathematics.s3.amazonaws.com/attachments/000/000/433/original/three\_tenframe.pdf?AWSAccessKeyId=AKIA JFC4WL6K24MWHIRQ&Expires=1434465869&Signature=xoD8R1pPj70CwAXmRjQXv6K7lzU%3D](https://illustrativemathematics.s3.amazonaws.com/attachments/000/000/433/original/three_tenframe.pdf?AWSAccessKeyId=AKIAJFC4WL6K24MWHIRQ&amp;Expires=1434465869&amp;Signature=xoD8R1pPj70CwAXmRjQXv6K7lzU%3D) * **Math Literature:**<http://www.the-best-childrens-books.org/math-for-kids.html> * **Building a Math Talk Community:**<http://www.eduplace.com/math/mthexp/pdf/mathtalk.pdf> * **Math Talk 101:**<https://www.scholastic.com/teachers/blog-posts/genia-connell/math-talk-101/> * **Math Talk: The importance; Why use it?**:<http://mathsolutions.com/common-core-support/math-talk/> * **Math Talk conversation starter posters.**<http://mason.gmu.edu/~jsuh4/teaching/resources/Buildingmathideas.pdf>   + The last two pages include an explanation of how to use Math Talk to build mathematical ideas and discourse. * [**Introduction to Math Mountains:** Math Mountains show a total at the top and a set of partners for the total at the bottom. They are called ‘Math Mountains’ because they look like mountains.](http://mllynch.blog.greenville.k12.sc.us/files/2012/09/Family-Letter-Math-Mountains-Snip.jpg)   + [**Story of the Tiny Tumblers:** “Tiny Tumblers live at the top of the Math Mountain. Every day some of them go to play on one side of the mountain, and the rest go to play on the other side.” Children find the partners of the total at the top of the Math Mountain by drawing circles to show how many Tiny Tumblers they were putting on each side.](http://mllynch.blog.greenville.k12.sc.us/files/2012/09/Family-Letter-Math-Mountains-Snip.jpg)   + [Tell students that the Total is at the top of the mountain (Total at the Top), and the partners roll down either side and are written there.](http://mllynch.blog.greenville.k12.sc.us/files/2012/09/Family-Letter-Math-Mountains-Snip.jpg)   + [Teacher Note: Students can use Math Mountains as a math tool and then as a strategy to decompose numbers to find possible number partners and combinations. Also, Fact Families can be found using Math Mountains; 5=4+1, 5=1+4, 5-4=1, 5-1=4.](http://mllynch.blog.greenville.k12.sc.us/files/2012/09/Family-Letter-Math-Mountains-Snip.jpg) * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** Number Blocks Freeplay.<http://www.mathsisfun.com/numbers/number-block-freeplay.html>   + Suggestion: Use in whole group instruction to model decomposing and composing numbers through 10. * **Teaching Tool:** Beadstring:<http://ictgames.com/brilliant_beadstring_with_colour.html>   + Choose one or two beadstrings. Practice bonds of 10 or 20, number facts to 10 or 20. * **Interactive Whiteboard**: Triangular Cards:<http://www.topmarks.co.uk/Flash.aspx?f=triangularcardsv4>   + Useful for demonstrating inverse operations and fact families. Select either Bonds within 10 or add to 10. * **Interactive Addition Game:**<http://www.sheppardsoftware.com/mathgames/earlymath/bugabalooShoes.htm>   + Five different levels to choose from to practice math facts. * **Interactive Game**:<http://illuminations.nctm.org/Activity.aspx?id=3563>   + Independent of partner game in which students match whole numbers, shapes, fractions, or multiplication facts to equivalent representations.”   + Teacher Note: Use the 1-6 or 1-10 number range within Units 1 and 2. * **Interactive Game:** Making ten:<http://illuminations.nctm.org/activitydetail.aspx?id=75>   + Making ten using the tens frame. |
|  |
| **Assessing decomposing through 10:** Ask children to write the partners for a number (4-10), switch the partners, and describe a pattern noticed.  **Assessing extending the number sequence to count forward by ones to 120 starting at any number:**   * Provide pencil and paper to the student. Read the problem to the student: *Mrs. Ledbetter is counting students as they enter the classroom. She has just counted the 5th student. What numbers will Mrs. Ledbetter say for the next 5 students?*   **Assessing extending the number sequence to read, write and represent numbers to 100 using concrete models, and standard form; and Assessing extending the number sequence to read and write in word form numbers zero through nineteen, and multiples of ten through ninety.**   * **Number of the Day Stretch:** A way to assess students’ number sense as well as their ability to represent numbers in multiple ways. Suggested questions to informally assess: * Why do you think it is important to be able to represent numbers in different ways? When do we usually use number words to represent numbers? When do we use numerals? When do we use pictures of diagrams? When do we use number sentences? Why do we sometimes choose one method of representation rather than another? * Teacher Note: This can also be assessed throughout the school year as the range of numbers increases within classroom instruction.   Return to [Table of Contents](#Table_of_Contents) |

| **Course/Grade:**1st grade  **Unit:** Composing and Decomposing Numbers Through 10 | **Task Title:** Hula Hoop Part-Part Whole  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) | |
| --- | --- | --- |
| **State Standards Addressed** | 1.ATO.1, 1.ATO.3, 1.ATO.5, 1.ATO.61  1.ATO.1 Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions. | |
| **Mathematical Process Standards Addressed** | 1c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. 2a. Make sense of quantities and their relationships in mathematical and real-world situations. 4a. Identify relevant quantities and develop a model to describe their relationships. 4b. Interpret mathematical models in the context of the situation. 6c. Use appropriate and precise mathematical language. | |
| **Materials and Resources** | 3 hula hoops (2 small and 1 large)  2 rulers  10 pencils (other readily available school supply)  10 or more beanbags (or other manipulatives if beanbags are not available)  Laminated part-part-whole mat for each student (see attachment)  Dry erase marker for each student  10 or more counters for each student | |
| **Task Description** | **Session 1:**  1. Gather students in a U-shape on the floor. (See illustration)  2. Place the three hula hoops in the middle of the U in a triangle shape connected with rulers (See attached)  3. The teacher will ask the students “What do you see?” and “What do you wonder?”  4. The teacher will record answers on a t-chart. (see attached for examples)  5. The teacher will state the I Can Statement: I can demonstrate part-part-whole.  6. The teacher will then explain the part-part-whole model in the following way: “You have come up with some really good answers. Now I want to tell you a story and see if we can figure out how to use these circles in math.”  7. The teacher will tell the following story:  “Johnny has 2 pencils at his desk (teacher places 2 pencils in one of the smaller hula hoops). Sally has 3 pencils at her desk (Teacher places 3 pencils in the other small hula hoop). Have students turn and talk with a partner to answer the following question: How many pencils do they have altogether and how do you know?  8. Have students come back together to share and explain their ideas.  9. The teacher will chart all students’ solutions. (Even misconceptions)  10. The teacher can call on students to show their solutions using the pencils and hula hoops while asking guided questions such as “How can we use the big circle to prove our answers?”  11. Students will justify their solution by manipulating the pencils into the larger circle.  12. The teacher will then revisit the I See/Wonder chart to expand on mathematical concepts and then name and explain the purpose of the part-part-whole mat. (the two smaller circles represent the smaller numbers (parts) and the larger circle represents the solution/answer (whole).  13. The teacher will connect the task to the I Can Statement…. I can demonstrate part-part-whole.  **Session 2:**  1. Review previous day learning by reviewing the I can statement and math vocabulary (part and whole).  2. The teacher will introduce their own story problem within 10 and have the students discuss how to solve.  3. Once students have discussed problems and solutions, the teacher will give each student their own part-part-whole mat, dry erase marker and counters.  4. The students will then use their individual mats to solve a teacher dictated story.  5. They will then explain to a partner how they solved the problem and justify their solution.  6. The teacher will then ask the students “Can you still solve this problem if we rearrange the circles? “Will it change our answer?” (Move the position of the big circle)  7. The teacher will graph predictions.  8. The teacher will then rearrange the hula hoops and ask the students to discuss what they now notice.  9. The teacher will then repeat the earlier problem and ask for volunteers to solve the problem.  10. Students will then use hand gestures to indicate if they agree or disagree with the solution and justify their answer.  11. To close the lesson the teacher will ask the students to share with a partner why it doesn’t matter where the big circle is located.  **Session 3:**  1. The teacher will ask students to recall the previous two days and restate the I can statement.  2. Each student will be given a laminated part-part-whole mat, dry erase marker and 10 counters.  3. Students will work with a partner to come up with and solve their own stories within 10. The partners should be encouraged to justify their story problems and check each other’s work.  4. If the teacher notices that groups are quickly solving and able to explain their thinking, they can be given up to 20 counters to work with.  5. If the teacher notices groups that are struggling solving and explaining their thinking they can be given fewer counters to work with. (5 counters)  6. The teacher will encourage students to manipulate their mats where the big circle (whole) is in different positions.  7. The teacher will conclude the lesson by having students explain what they discovered by using part-part-whole mats and restate the I can statement.  **E-Learning Modification:** If teachers are demonstrating through a “live lesson” they can show as written. If students are doing this from home they can use two different sized bowls/plates/cups/lids to form the Part-Part-Whole mat. They can also use household objects or items from nature to use in the story problems. Students can then record their notice/wonder and thinking via district approved platforms. Teachers can also record a mini-lesson of them doing the lesson on recording platform. | |
| **Equitable Access** | By giving students the opportunity to discuss what they see and what they wonder, they are all able to contribute to the conversation. Students will also have the opportunity to make up their own stories that relate to their own personal experiences.  **Early Entry Point:** Students can start with 5 and then move to 10 then 20 and 20+.  **Foundational Entry Point:** Students can generate addition and subtraction equations that represent their part-part-whole relationship with a number. | |
| **Mathematical Vocabulary** | * Part * Whole * Part-part-whole | * Counters * Compose * Numbers |
| **Student Reflection** | Students will be given opportunities to explain and justify their thinking. They will be revisiting predictions to determine if their conclusions are correct and how they may have changed. | |

Return to [Table of Contents](#Grade_One_Table_of_Content)





T-Chart Student Anticipated Responses

| What I See  Example Answers:   * I see 3 hula hoops * I see rulers * I see 3 circles | What I Wonder  Example Answers:   * Are we going to learn how to hula hoop * Why are they different sizes * Are we going to measure |
| --- | --- |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:** Composing and Decomposing Numbers Through 10 | **Task Title:** Patterns of Counting  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.ATO.9.b, 1.NSBT1.a, 1.NSBT.1.b  Extend the number sequence to:  a. count forward by ones to 120 starting at any number;  b. count by fives and tens to 100, starting at any number;  c. read, write and represent numbers to 100 using concrete models, standard form, and equations in expanded form;  d. read and write in word form numbers zero through nineteen, and multiples of ten through ninety. |
| **Mathematical Process Standards Addressed** | 2a. Make sense of quantities and their relationships in mathematical and real-world situations. 7b. Recognize mathematical repetition in order to make generalizations. 7c. Look for structures to interpret meaning and develop solution strategies. |
| **Materials and Resources** | 120 chart laminated for each student  Large 120 chart for demonstration purposes  55 linking cubes per student (if you do not have enough cubes students can work with a partner or even small group)  Dry erase markers  Count to 100 Song <https://family.gonoodle.com/activities/count-to-100>  “Count to 100.” *GoNoodle*, family.gonoodle.com/activities/count-to-100. |
| **Task Description** | Session 1:   1. The teacher will begin this task by playing the GoNoodle song “Count to 100” and having the students sing along. [Go Noodle](https://app.gonoodle.com/activities/count-to-100?s=category&t=Math) 2. The teacher will state the I Can Statement: “I can count to 120 using a 120 chart.” 3. The teacher will project or display the large 120 chart. 4. The students will be asked what they see and what they wonder. Results will be charted on a t-chart (see attached). 5. The teacher will ask all students to tell their favorite number that is listed on the chart and explain why. (Possible sentence stem: My favorite number is \_\_\_\_ because \_\_\_\_\_.) 6. The teacher will then ask “How do you think we could use this to count?” “Where would we start and which direction would we go?” “Which direction would you go when you get to 10?” 7. The teacher will then introduce the vocabulary terms rows and columns. 8. The teacher would then ask “What do you notice about the numbers in each row?” 9. The teacher will then have the students use linking cubes to build the numbers 1-10 on the 120 chart. (see attached picture) 10. Once completed, the teacher will ask the students to explain what they now notice. 11. The teacher will then say to the students: “Now that we know that each time we say a number in a row we are adding 1 more. Let’s count to 120 by ones and point to each number on your chart as we count. 12. After counting the teacher and students will revisit the I See/Wonder Chart to make sure all “wonders” have been addressed. 13. The teacher will conclude the lesson by restating the I Can statement and asking students to explain to a partner how they can use a 120 chart to count to 120.   **Session 2:**   1. To review previous day’s learning the teacher will replay the “Count to 100” song and encourage the students to sing along. [Go Noodle](https://app.gonoodle.com/activities/count-to-100?s=category&t=Math) 2. The teacher will state the I Can Statement for the day which is…..I can count by ones and tens. 3. The students will take out their 120 chart. The teacher will replay the song and stop the video each time a kid or different GoNoodle Champ appears and have the students color in the block where the Champ changes. The teacher will ask the students “Why do you think the GoNoodle Champs change?” and “What is the same and what is different about each number that you colored?” 4. Responses will be charted. 5. The students will either work independently or with partners/groups to use linking cubes to build the numbers 1, 11, and 21 on the chart. The teacher will ask the students to explain what they notice. (Hopefully the students will notice each time they are having to add ten more cubes. If not, the teacher will guide them to that discovery.) 6. The teacher will link the idea that just like in kindergarten when they learned to count by tens from the 10s column (10, 20, 30, 40…) they are also counting by tens when they move up or down **any column**. So, if you start at the number 26, ten more would be 36. 7. The students will then work with a partner and take turns counting by ten on the chart. Partner A will point to a number on the chart and Partner B will then start at that number and count by 10. Then partners will change roles. 8. To conclude the lesson the teacher will point out that just like the 120 chart can be used to count by ones it is also helpful when you are counting by tens.   **E-Learning Modification:** The teacher can send out a 120 chart for students to print. Students can use Legos or pennies or anything else stackable in place of the linking cubes. |
| **Equitable Access** | Students can start at any number on the 120 chart. Students are all able to contribute to the conversation during I See/I Wonder. Students can use the printed number on the video to help with counting if they don’t know which number comes next.  **Early Entry Point:** Students need experiences recognizing bundling and unbundling ten flexibly to understand place value.  **Foundational Entry Point:** Students can count up and down in patterns from any number up to 120 and generate an equation to justify. |
| **Mathematical Vocabulary** | 120 Chart  Row  Column  Ones  Tens  Digit  Number  Count  Skip count |
| **Student Reflection** | Session 1 Reflection:  Students explore and discuss with a partner how a 120 chart helps them count to 120. Session 2 Reflection:  Ask students what happens when you move up the chart instead of down. Are you still counting by 10s? Students will be able to show their understanding of counting by ten when they point to a number on the chart and their partner has to start at that number and count by 10. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

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Unit 1 Lesson 2 Part 1 Example

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Unit 1 Lesson 2 Part 2 Step 5 Example

T-Chart (Anticipated Student Responses)

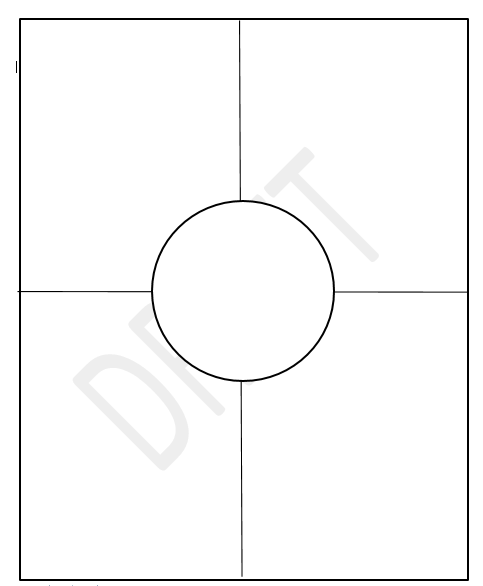
| What I See | What I Wonder |
| --- | --- |
| * Numbers * Squares * Rows * The numbers get bigger * There is no zero | * What is this? * Is it a game? * What are those big numbers? |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **1st Grade Math Unit 2:**  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Grade Overview](#Overview_of_K_5_Units) |
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| **Addition and Subtraction Strategies** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.ATO.7** Understand the meaning of the equal sign as a relationship between two quantities (sameness) and determine if equations involving addition and subtraction are true.   + Students understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value. * **1.ATO.8** Determine the missing number in addition and subtraction equations within 20.   + Students should use number sense as well as concrete and pictorial models such as number lines while identifying the missing whole number within at most a four term equation. * **1.ATO.1** Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions.   + Students should use spoken words, concrete objects, drawings such as tape diagrams, pictorial models, length-based models (i.e., connecting cubes), number lines, and number sentences to solve story problems involving strategies of adding to, taking from, putting together, taking apart, and comparing, with the unknown as any one of the terms . In the problem such as 2 + 4 = []; 3 + [] = 7; and 5 = [] -3. Students may use a variety of basic fact strategies such as composing a 10 and decomposing a number leading to 10. Students should explain the problem-solving strategy with spoken words, concrete objects, pictorial models, and number sentences.   + Addition and subtraction have been separated into four categories; join problems, part-part-whole problems, separate problems, and compare problems. Each category has three numbers, and any one of the three numbers can be the unknown in a story problem.   + Teacher Note:***Joining*** action-*involves t*hree quantities; an initial amount, a change amount (the part being added or joined), and the resulting amount (the amount after the action is over). **Part-Part-Whole** action-involves two parts that are combined into one whole. There is no meaningful distinction between the two parts within a part-part-whole situation, so there is no need to have a different problem for each parts as the unknown. **Separation action** involves three quantities; the initial amount as the whole or the largest amount, a change, and result amounts. **Compare problems** involve the comparison of two quantities, and the third amount is the difference between the two amounts. (Adapted from Van de Walle) * **1.ATO.2** Solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20.   + Teacher Note: Students should use concrete objects, pictorial models, and number sentences when solving problems. * **1.ATO.4** Understand subtraction as an unknown addend problem.   + Support: Subtract 10-7 by finding the number that makes 10 when adding 7. This standard is laying the foundation for the inverse relationship between addition and subtraction. Whereas ATO.8 is finding the missing number using any strategy. * **1.ATO.3** Apply Commutative and Associative Properties of Addition to find the sum (through 20) of two or three addends.   + Students should use concrete, pictorial, and verbal representations of the commutative property and associative property of addition when solving. It is not important that students know the property name, but the concept the property provides.   + Teacher note: Build on the concepts of number combinations explored in Unit 1. Students should begin to use symbols appropriately (i.e., +,-,=) within the combinations of the three quantities. * **1.ATO.6** Demonstrate:   a. addition and subtraction through 20  b. fluency with addition and related subtraction facts through 10.   * + - Students should use strategies such as counting on, making 10, decomposing a number leading to a 10, using the relationship between addition and subtraction, creating equivalent but easier or known sums, doubles plus or minus one, counting back, and the commutative property. Understand the role of 0 in addition and subtraction. Fluency is defined as efficient, accurate, and flexible. Phases of operational understanding: construct operational meaning, develop reasoning strategies, and work toward quick recall.     - Teacher Note: The NCTM Principles and Standards for School Mathematics defines **computational fluency** as having efficient, flexible, and accurate methods for computing. Computation fluency of “mathematical fluency” with whole numbers is an essential guide for school mathematics and forms the foundation for many higher level math concepts. * **1.NSBT.1** Extend the number sequence to:   a. count forward by ones to 120 starting at any number;  b. count by fives and tens to 100, starting at any number;  c. read, write and represent numbers to 100 using concrete models, standard form, and equations in expanded form;  d. read and write in word form numbers zero through nineteen, and multiples of ten through ninety.   * Individually and in sequence * One purpose for counting by groups (“unitizing”) is to make counting more efficient. * Teacher Note: Extend the number sequence as the year progresses. |
| **New Academic Vocabulary for This Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * unknown result * unknown change * unknown start | * equation * difference * doubles fact | * making ten * doubles +1 * doubles -1 |  |  | |
| **Prior Knowledge Required for This Unit** |
| Before moving into Unit 2, students need to have a strong understanding of number concepts and relations begun in Kindergarten and repeated in 1st grade Unit 1. It is essential for students to know how to independently decompose and compose numbers through 10 before beginning Unit 2. Students need to have an understanding of the concepts of addition and subtraction and understand the meaning of the operations and the actions it takes to make a group larger, smaller, and on number relations.  Students will develop strategies for adding and subtracting whole numbers based on their prior work with small numbers in Kindergarten and in Unit 1. Students need to understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). Once students understand the meaning for the operations of addition and subtraction they are ready to extend their thinking and begin practicing math fact fluency. |
| **Subsequent Knowledge Related to This Unit** |
| In Unit 2 students will build on their understanding of number concepts and relations, extending their thinking to using strategies for adding and subtracting. They will use their understanding of the operations as a foundation to build-on as they continue to recognize connections within addition and subtraction. The focus of Unit 2 will be on taking students’ understanding of numbers and applying concepts to extend their thinking and begin practicing math fact fluency. Once students recognize and understand the relationship between counting and addition and subtraction they will 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 in Units 3 and 4. By comparing a variety of solution strategies in Unit 2, children build on their understanding of the relationship between addition and subtraction.  Unit 2 will be an introduction on addition and subtraction strategies. Unit 2 will connect new facts to previously discussed number concepts; providing opportunities for students to continually build mastery of addition and subtraction basic facts through 10 in first grade and through 20 in 2nd grade. As connections are made, and new facts/concepts are introduced students extend their understanding of strategies to use as they solve problems. Emphasis on ‘making ten’ is crucial because 10 is the foundation of our number system. Students should be provided with multiple experiences in exploring the different ways in which 2 addends result in a sum of 10. This knowledge becomes critical as they explore using tens as a strategy for finding unknown facts in Unit 4.  Students who understand the concepts of addition and subtraction are able to understand the connections between math facts and real situations (i.e., the flowers in a vase with 2 lilies and 9 tulips are represented by 2+9). These students are better equipped to effectively solve math problems by choosing the operation that makes sense (i.e., “If you put together the lilies and tulips, you get how many flowers are in the vase altogether, so you have to add 2+9 to find that out.”). They are able to make reasonable judgments about sums and differences (i.e., “It’s a little more than 10 because 2+8=10.”). And students who understand the concepts of addition and subtraction are better prepared to begin the task of memorizing math facts in later grades because they understand what they are being asked to memorize. It’s important to build understanding prior to focusing on fluency. (adapted from *Mastering the Basic Math Facts in Addition and Subtraction*)  Our goal is to continually reinforce the ideas related to math facts as we help students develop addition and subtraction strategies; providing a foundation for solving more complex facts in later units and grades. Continuation of providing a variety of meaningful and engaging experiences, students develop an understanding of the number combinations working towards mastery of understanding the meaning of addition and subtraction and applying operations to problem solving. |
| **Relationship Among Standards in This Unit** |
| The standards in this unit are clustered together with the intention of continuing to build a strong foundation of number sense, understanding numbers and the operations of addition and subtraction while developing strategies. This understanding takes time. Unit 2 is an extension from decomposing and composing numbers within 10 to relating the same concepts with applying properties of addition to add whole numbers and to creating and using strategies based on these properties to solve addition and subtraction problems of quantities within 20.  Standards are repeated with the intention of extending the range of numbers within as you progress through the year. Standards should not be taught in isolation nor are students expected to show mastery of the standard by the end of a given unit. Students need opportunities for investigations, discussions, hands-on explorations, visual models, stories problems, and time to explore concepts.  The standards in Unit 2 encourage students to begin recognizing addition and subtraction problems, write equations using symbols to represent addition and subtraction situations, use connected strategies to solve for unknowns. Discuss different types of equations, decide if they are true or false, and develop strategies for adding and subtracting within 20. The students will grasp an understanding of the procedural aspect and begin using symbols to represent different operations and facts. Strategies for adding and subtracting within 20 will be developed.  ***Teacher Note:***  Students need to attach meaning to the operations before there is any focus on fact fluency. The big Ideas about numbers that help students make sense of math facts should be at the center of teaching math facts are: our number system is a system of patterns, the order of the factors does not change the sum (commutative property), addition and subtraction are inverse operations (e.g., Fact Families), and numbers are flexible; they can be broke apart to more easily perform an operation. (adapted from *Mastering the Basic Math Facts in Addition and Subtraction*) |
|  |
| Learning experiences should take students from world experiences, to concrete materials, then to visual (and other) representations, before expecting abstract representations. Once students explore strategies and have a strong understanding move towards applying strategies in order to problem solve story problems.  “Provide opportunities for students to participate in shared problem solving activities to solve word problems. Use a variety of models such as drawings, words, and equations with symbols for the unknown numbers to find the solutions. Additionally students need the opportunity to explain, write and reflect on their problem-solving strategies. Students need the opportunity of writing and solving story problems involving three addends with a sum that is less than or equal to 20. Literature is a wonderful way to incorporate problem-solving in a context that young students can understand. Many literature books that include mathematical ideas and concepts have been written in recent years. For Grade 1, the incorporation of books that contain a problem situation involving addition and subtraction with numbers 0 to 20 should be included in the curriculum. As the teacher reads the story, students use a variety of manipulatives, drawings, or equations to model and find the solution to problems from the story.” ([Flipbooks](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf)) ***Teacher Note:*** Students need to analyze word problems and avoid using keywords to solve them.  ***Teacher Note: 1.ATO.1:***  Teachers should be aware of the three types of problems; Result Unknown, Change Unknown, and Start Unknown, and provide multiple experiences for their students solving ALL three types of problems as strategies are developed. The unknown symbols should include boxes or pictures, and not letters. Use informal language (add, minus/subtract, the same as) to describe joining (putting together) and separating situations (breaking apart). ([Flipbooks](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf))  **1.ATO.1, 1.ATO.5, 1.ATO.6**  **Lesson: Ways to Make 10**  In this lesson, students will count-on from embedded numbers. Students will use the strategy of counting on from the first addend. This lesson is a continuation of the concepts from Unit 1. It is important for students to have multiple experiences with finding two addends whose sum equals 10.  **Objective:** Represent all the number pairs of 10 as number bond diagrams from a given scenario and generate all expressions equal to 10.  (Download the Module 1, Topic B, lesson 8.) [Engage NY Grade 1 Lesson 8](https://www.engageny.org/resource/grade-1-mathematics-module-1-topic-b-lesson-8)  **Grade 1 Module 1: Sums and Differences to 10: 1.ATO.1, 1.ATO.5, 1.ATO.6,**   * [Grade-1-Mathematics-Module-1-Topic-C](https://www.engageny.org/resource/grade-1-mathematics-module-1-topic-c) * “In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 as they are presented with opportunities intended to advance them from counting all to counting on which leads many students then to decomposing and composing addends and total amounts.” * Refer to Lessons 9-39   **Grade 1 Module 2: Introduction to Place Value Through Addition and Subtraction Within 20**   * [Grade-1-Mathematics-Module-2-Topic](https://www.engageny.org/resource/grade-1-mathematics-module-2-topic) * Module 2 serves as a bridge from students' prior work with problem solving within 10 to work within 100 as students begin to solve addition and subtraction problems involving teen numbers. Students go beyond the Level 2 strategies of counting on and counting back as they learn Level 3 strategies informally called "make ten" or "take from ten." * Teacher Note: Module 2 Topics A-C, Lessons 1-25 can be used within this Unit.   **Task: Making a ten:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/1/OA/C/6/tasks/1169)   * This task is designed to help students visualize where the 10's are on a single digit addition table and explain why this is so.   **Task: Solving a real-world story problem: 20 Tickets:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/tasks/1152)   * The purpose of the task is for students to add and subtract within 20 and represent complex addition problems with an equation to increase their understanding of and flexibility with the equals sign.   **Task: Fact Families:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/1/OA/B/tasks/1214)   * “The purpose of this task is for students to identify and write sets of related addition and subtraction equations; these are often known as "fact families" because the equations are related by the same underlying relationship between the numbers. This task reinforces the commutative property of addition and using the relationship between addition and subtraction. It is best given after the students have had quite a bit of experience adding and subtracting within 10.”   **Task: Domino Addition:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/tasks/1219)   * “The purpose of this task is to help students understand the commutative property of addition. Because the total number of dots is the same regardless of how a domino is oriented, the domino reinforces the idea that the addends can be written in any order.”   **Task: Equality Number Sentences:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/tasks/475)   * This task helps students understand the meaning of the equal sign and to use it appropriately.   **Daily Activity: Number of the Day Stretch:**   * [https://books.google.com/books?id=vQDOAwAAQBAJ&pg=PA39&lpg=PA39&dq=number+of+the+day+stretch&source=bl&ots=wkvMTBeu4R&sig=\_YRGevESgrcZxoUPND6j74xDIS4&hl=en&sa=X&ved=0CB8Q6AEwAGoVChMI77DK\_76UxgIVg5WACh1nfACx#v=onepage&q=number% 20of%20the%20day%20stretch&f=false](https://books.google.com/books?id=vQDOAwAAQBAJ&amp;pg=PA39&amp;lpg=PA39&amp;dq=number%2Bof%2Bthe%2Bday%2Bstretch&amp;source=bl&amp;ots=wkvMTBeu4R&amp;sig=_YRGevESgrcZxoUPND6j74xDIS4&amp;hl=en&amp;sa=X&amp;ved=0CB8Q6AEwAGoVChMI77DK_76UxgIVg5WACh1nfACx%23v%3Donepage&amp;q=number%20of%20the%20day%20stretch&amp;f=false)   [**Creating Story Problems**](https://books.google.com/books?id=vQDOAwAAQBAJ&amp;pg=PA39&amp;lpg=PA39&amp;dq=number%2Bof%2Bthe%2Bday%2Bstretch&amp;source=bl&amp;ots=wkvMTBeu4R&amp;sig=_YRGevESgrcZxoUPND6j74xDIS4&amp;hl=en&amp;sa=X&amp;ved=0CB8Q6AEwAGoVChMI77DK_76UxgIVg5WACh1nfACx%23v%3Donepage&amp;q=number%20of%20the%20day%20stretch&amp;f=false)**:**  In this activity, student will focus on reading/ listening comprehension skills as they apply to mathematics story problems, as well as on written and verbal mathematics communication skills. Using classic literature as inspiration children will apply their understanding of addition and subtraction situations and operations to create, describe, and solve story problems.  **Objective:**  Students will write and solve story problems involving a variety of situations, choosing strategies including- part-part- whole, comparing, grouping, doubling, counting on and counting back situations. Students will use drawings, equations, and written responses to solve single story problems.  [http://gadoe.georgiastandards.org](http://gadoe.georgiastandards.org/DMGetDocument.aspx/Lesson-plan.pdf?p=6CC6799F8C1371F69A35A3B787E603C58D358EDDDB47CE5FDCDC021EC00DA6E8&Type=D) |
| **Instructional Resources** |
| Below is a suggested teaching sequence from *Mastering the Basic Math Facts in Addition and Subtraction (p.12)* suggests beginning with simpler facts and then connect each new set of facts to students’ previous experiences rather than asking students to memorize 121 combinations of addition and 121 combinations of subtractions.   |  |  | | --- | --- | | **FOUNDATION FACTS:** |  | | +1/+2 | Students build on their understanding of counting by exploring 1 or 2 more and 1 or 2 less. | | +0 facts | Using their knowledge of the concept of addition, students explore what happens when they add or subtract nothing from a quantity. | | +10 facts | Adding 10 to a single-digit number results in a 2-digit sum. Students explore adding 10 in order to build understanding and automaticity that will be needed later when exploring the using-ten strategy. | | Doubles | Students explore the concept of doubling and what it means to add 2 groups of equal size. | | Making ten facts | Students need many opportunities to explore ways to combine numbers to form 10. It builds a strong foundation for students to build mastery of other facts. | | Building on the Foundation (Facts) | | | Using 10s | Now that students know combinations of addends that have a sum of 10, they use their understanding of the flexibility of numbers to find way to break apart addends to create simpler facts by using tens (e.g., 9+7 is changed to 10+6).  I know 8+2+10. So 8+3+11. 3 is 1 more than 2 and 8+2=10, so 8+3=11 | | Using doubles | Students’ knowledge of doubles facts is now put to use to find unknown facts that are near doubles (e.g., 4+5 might be thought of as 4+4+1). |   **KATM Grade 1** [**Flipbook**](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf):  Common Core Standards for Mathematics Flip Book Grade 1  **Math Literature:**<http://www.the-best-childrens-books.org/math-for-kids.html>  **Building a Math Talk Community:**<http://www.eduplace.com/math/mthexp/pdf/mathtalk.pdf>  **Math Talk: The importance; Why use it?**:<http://mathsolutions.com/common-core-support/math-talk/>  **Math Talk conversation starter posters:**<http://mason.gmu.edu/~jsuh4/teaching/resources/Buildingmathideas.pdf>  The last two pages include an explanation of how to use Math Talk to build mathematical ideas and discourse.  Resources for Interactive Sites:   * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** Number Blocks Freeplay.<http://www.mathsisfun.com/numbers/number-block-freeplay.html>   + Suggestion: Use in whole group instruction to model decomposing and composing numbers through 10. * **Teaching Tool:** Beadstring:<http://ictgames.com/brilliant_beadstring_with_colour.html>   + Choose one or two beadstrings. Practice bonds of 10 or 20, number facts to 10 or 20. * **Interactive Operations Games:**<http://jmathpage.com/JIMSNumberoperations.html> * **Interactive Game**:<http://illuminations.nctm.org/Activity.aspx?id=3563>   + Independent of partner game in which students match whole numbers, shapes, fractions, or multiplication facts to equivalent representations.”   + Teacher Note: Use the 1-6 or 1-10 number range within Units 1 and 2. * **Interactive Game:** [Number Bonds 10**:**](http://www.mathplayground.com/number_bonds_10.html) |
| **Instructional Resources** |
| **Assessing 1.ATO.1:** The following links include a task for students to solve. [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/1/OA/A/1)  [**Assessing Sums and Differences to 10:**](https://www.engageny.org/resource/grade-1-mathematics-module-1-topic-c)   * Click on Mid-Module Assessment or End-of-Module Assessment under Downloadable Resources for samples   **Assessing extending the number sequence to read, write and represent numbers to 100 using concrete models, and standard form; and Assessing extending the number sequence to read and write in word form numbers zero through nineteen, and multiples of ten through ninety.**   * **Number of the Day Stretch:** A way to assess students’ number sense as well as their ability to represent numbers in multiple ways. Suggested questions to informally assess: * Why do you think it is important to be able to represent numbers in different ways? When do we usually use number words to represent numbers? When do we use numerals? When do we use pictures of diagrams? When do we use number sentences? Why do we sometimes choose one method of representation rather than another? * Teacher Note: This can also be assessed throughout the school year as the range of numbers increases within classroom instruction.   Return to [Table of Contents](#Table_of_Contents) |

| **Course/Grade:**  1st grade  **Unit:**  Understanding Place Value | **Task Title:** Using Number Sense to Represent Numbers in Multiple Ways  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.1 Extend the number sequence to:  a. count forward by ones to 120 starting at any number;  b. count by fives and tens to 100, starting at any number;  c. read, write and represent numbers to 100 using concrete models, standard form, and equations in expanded form;  d. read and write in word form numbers zero through nineteen, and multiples of ten through ninety. |
| **Mathematical Process Standards Addressed** | 4a. Identify relevant quantities and develop a model to describe their relationships. 5a. Select and use appropriate tools when solving a mathematical problem. 6b. Represent numbers in an appropriate form according to the context of the situation. |
| **Materials and Resources** | Counters  Place value blocks  Linking Cubes  Popsicle Sticks  Numeral Cards  Small Tens Frames  Rekenrek  Number Word Chart  120 Chart  Laminated Work Mat (see attached)  Dry Erase Marker |
| **Task Description** | 1. Student demonstrate counting to 120 from a given number. 2. The teacher will show the students materials above and ask students how these materials can be used to represent numbers. 3. The students will then be placed in groups of 2. 4. Materials will be placed in a central location for student use. 5. The teacher will distribute a work mat (a template for the number to go in the middle circle and the representations to go in the four blocks) and a numeral card (1-20) to each group. 6. Students will be instructed to choose materials to represent their numeral four different ways on the mat. 7. Once complete the students will go on a gallery walk around the room to see how each group represented their numeral. 8. Once back together as a group the students will discuss and chart all of the different ways they observed numbers represented. 9. This task can then be placed in a math station for students to continue practice representing numbers in different ways.   +++numeral cards should go up to 100 but can be placed in different groupings to facilitate differentiation.  **E-Learning Modification:** Students can use objects found at home to create a number. Students can then use a district approved platform to record and explain the different ways the number was made. Students can then take virtual gallery walks and make comments. |
| **Equitable Access** | Students can choose their own materials to build the number. The teacher can vary the difficulty of the numeral that is given to each group.  Early Entry Point: Students can represent 10 in multiple ways. After demonstrating they can decompose 10 flexibly, move into two-digit numbers.  Foundational Entry Point: Students can represent multi-digit numbers in a variety of ways including equations and expanded form. |
| **Mathematical Vocabulary** | numeral  number  digit  word form  standard form  equation  expanded form  tally marks  place value  ten frame |
| **Student Reflection** | Students will be able to see different ways to build a number through the gallery walk as well as explaining how they chose to represent their own number. |

Return to [Table of Contents](#Grade_One_Table_of_Content)



Unit 2 Task 1 Student Work Mat

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:**  Understanding Place Value | **Task Title:** Addition and Subtraction with Number Bonds  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.ATO.1, 1.ATO.3, 1.ATO.4, 1.ATO.6, 1.ATO.7, 1.ATO.8,1.NSBT.1.a  1.ATO.6 Demonstrate:  a. addition and subtraction through 20;  b. fluency with addition and related subtraction facts through 10. |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 1b. Recognize there may be multiple entry points to a problem and more than one path to a solution. 1c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. |
| **Materials and Resources** | 2 small hula hoops  1 larger hula hoop  2 rulers  Objects to manipulate  Counters for each student  Individual part-part-whole mat for each student (laminated)  Dry erase marker for each student  [Addition/subtraction song](https://www.youtube.com/watch?v=NHI0ePgwlgU) https://www.youtube.com/watch?v=NHI0ePgwlgU |
| **Task Description** | These tasks are for introducing addition, subtraction and commutative property and ***are not*** meant to be taught in consecutive days. Many tasks will require many days of revisiting. From these tasks you can demonstrate the skill being taught with ten frames, rekenreks, number lines, etc.  **Addition:**   1. Introduce lesson with the “I can statement….I can add numbers.” 2. Play Addition and Subtraction song. The teacher will write down the addition equation from the song. 3. After listening to the song students can discuss addition and subtraction with a partner. 4. Recall part-part-whole from Unit 1 lesson (Hula Hoop Part-Part-Whole) 5. The teacher will show the addition equation from the song and ask students to explore ways that they could show the equation using their individual part-part-whole mats and counters. (2+3=5) 6. Students will share how they represented the equation from the song. 7. The teacher will write solutions on a chart the following way (see attached anchor chart). The teacher needs to make sure the math vocabulary is used while writing solutions and demonstrate operational relationships while discussing all of the different ways to make 5. 8. The teacher will then ask the students to use their mats to find other ways to make 5 and chart responses. (See attached anchor chart) 9. The teacher will review all solutions and ask students how they could replace the words and/is with math symbols they saw in the video and then add equations to the anchor chart. 10. Students would then be given opportunities to practice this concept with partners creating their own stories with varied sums and differences.   **Commutative Property:**   1. Review anchor chart from addition lesson and discuss all of the possible ways to make 5. 2. The teacher will ask the students what they notice about the different ways to make 5. 3. The teacher will draw attention to the first two examples (2+3=5 and 3+2=5) and ask how the two equations are alike and how they are different. 4. The teacher will name and explain the Commutative Property and reinforce that it does not matter which order the addends appear because the sum is always the same. 5. Students will then be able to work with a partner to create their own number bonds using the Commutative Property. One partner will create a number bond and write the corresponding equation and the other partner will then use the same equation to show the Commutative Property and write the corresponding equation. 6. To conclude the lesson the teacher will have several groups share their equations and once again reinforce that in addition the order of the addends does not change the sum.   **Subtraction:**   1. Revisit the addition/subtraction song from Addition lesson above. [Addition/subtraction song](https://www.youtube.com/watch?v=NHI0ePgwlgU) https://www.youtube.com/watch?v=NHI0ePgwlgU 2. Review addition by having students explain to a partner how using a number bond can help you add. 3. The teacher will then explain that today they are going to use that same number bond to subtract. 4. The teacher will use the demonstration number bond to have students explore/discover subtraction. The teacher will tell the following story: Johnny had 5 pencils (the teacher will put 5 pencils in the large hula hoop). He broke two pencils (the teacher will place two pencils in one of the smaller hula hoops and separate 2 from the 5 in the large hula hoop) (see attached example). The teacher will then ask “How many pencils does Johnny have left?” and have students talk with a partner to determine the answer and explain how they know their answer is correct. 5. The teacher will then tell students that they are going to watch a different video to determine if their solution is correct. [Addition and Subtraction Song](https://www.youtube.com/watch?v=L_1gwP8m2JM) 6. After watching the video, the teacher will insert and name the subtraction symbol and equal symbol to the demonstration number bond. 7. The teacher will then write the equation 5-2=3 and 5-3=2. 8. The students will then work with a partner, using their number bond mats and counters, to solve the following problem: Mom made 8 cupcakes. Sally ate 5 of them. How many cupcakes does mom have left? 9. Students will share their solution. 10. Students will work with a partner to solve the following problem. There were 9 pieces of candy in the bowl. Students will use their counters and number bond mats to create their own subtraction story, write the resulting equation and explain how they come up with their solution. 11. The students will continue practicing this skill by creating their own story problems with various quantities, demonstrating that they understand the concept of subtraction. 12. The teacher will conclude the lesson by restating the I can statement….I can subtract.   **E-Learning Modification:** If teachers are demonstrating through a “live lesson” they can show as written. If students are doing this from home they can use two different sized bowls/plates/cups/lids to form the Part-Part-Whole mat. They can also use household objects or items from nature to use in the story problems. Students can then record their notice/wonder and thinking via district approved platforms.  Teachers can also record a mini-lesson of them doing the lesson on Screencastify or other recording platform. |
| **Equitable Access** | Students are given opportunities to share and explain their thinking along with having choice in creating their own problems. Teacher should monitor story problems to ensure that students are working within numbers that students can decompose.  **Early Entry Point:** Students can use objects to demonstrate addition and subtraction  **Foundational Entry Point:** Students can transfer concrete models, to drawings that represent using the operations in order to make equations that represent sums and differences. |
| **Mathematical Vocabulary** | Plus  Minus  Add  Subtract  Addition  Subtraction  equals  Sum  Difference  Equation  number sentence  commutative property  addend  take away |
| **Student Reflection** | Students are able to share the problems that they created and explain their thinking. Students have the opportunity to work with open ended problems with multiple solutions. |

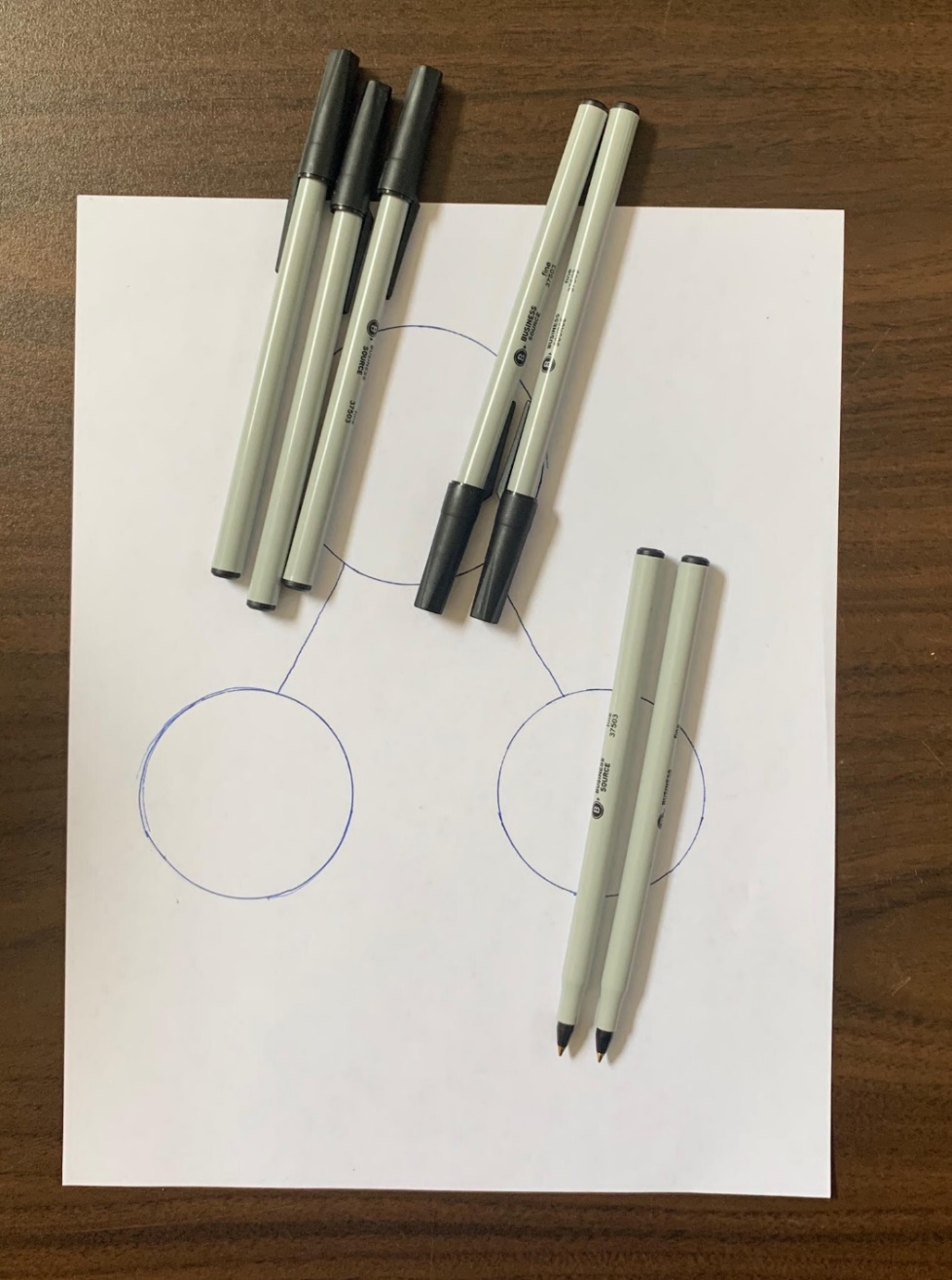
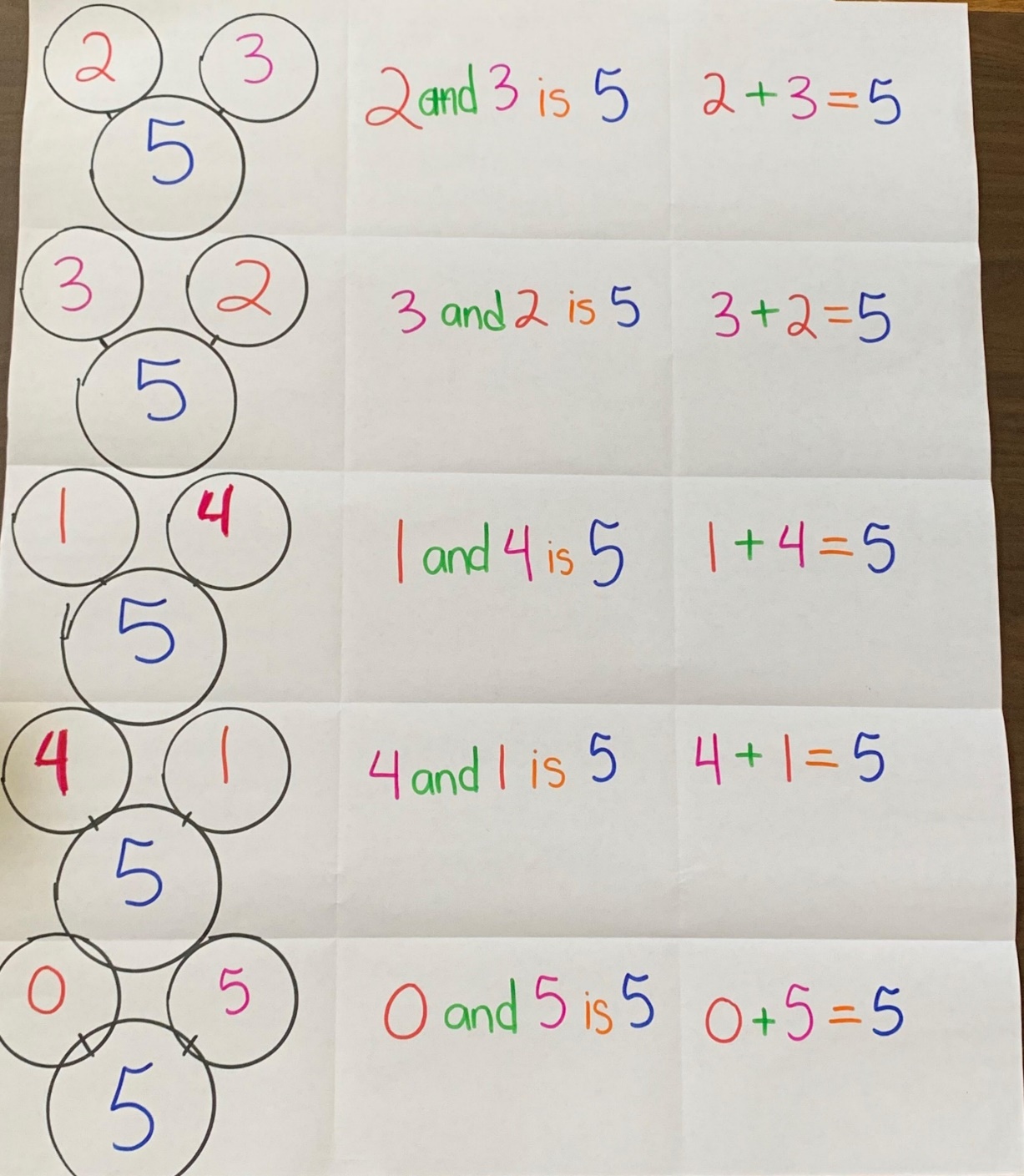


Figure Unit 2 Lesson 2 (Subtraction Lesson) Step 4



Unit 2 Lesson 2\_Anchor Chart for Step 7

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:** Understanding Place Value | **Task Title:** Adding Three Addends  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.ATO.2 Solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20. |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 1b. Recognize there may be multiple entry points to a problem and more than one path to a solution. 2a. Make sense of quantities and their relationships in mathematical and real-world situations. Click or tap here to enter text. |
| **Materials and Resources** | A group of ten school supplies for each group (all of the same material: 10 glue sticks, 10 crayons)  Expo marker for each group  Small white board for each group  3 small hula hoops  1 larger hula hoop  3 rules |
| **Task Description** | *This is an introductory lesson to adding three numbers and students will need multiple days of practice in order to make sense of operational thinking.*   1. The teacher will show the students a group of 10 school supplies. The teacher will ask the students what they notice about the group and how they may be used for math. Responses will be charted. 2. The teacher will tell the students that they are going to work with a partner and their own group of school supplies to create different addition word problems. 3. The teacher will give each partner group a group of 10 school supplies. 4. The teacher will instruct the students to use the school supplies to create a word problem and corresponding equation with the school supplies. 5. The students will share their stories/equations with another group. 6. The teacher will show the hula hoop number bond from Unit 2 lesson 2 and model how they were used to add. The teacher will add a small hula hoop to the bond to demonstrate the third addend. 7. The teacher will then ask the students to use the same supplies to create a word problem and equation that now has three addends. 8. The students will then share their new stories and equations with another group. 9. To conclude the lesson the students will meet as a group and discuss how this activity is the same as addition problems they have solved in the past and how they are different. 10. The teacher can expand this task through twenty as the students show flexiblity understanding through 10. Objects used can also change.   **E-Learning Modification:** If teachers are demonstrating through a “live lesson” they can show as written. If students are doing this from home they can use three different sized bowls/plates/cups/lids to form the Part-Part-Whole mat. They can also use household objects or items from nature to use in the story problems. Students can then record their notice/wonder and thinking via district approved platforms. |
| **Equitable Access** | All students can contribute to introductory discussion. Students are able to group their objects in different ways. The number of objects can be increased or decreased according to student needs and mastery.  Early Entry Point: Students can start exploring addends with sums of 5 and 10 flexibly, then increase in quantity.  Foundational Entry Point: Students can generate equations with three addends to represent a mathematical situation. |
| **Mathematical Vocabulary** | addends equations addition sum number sentence plus equal |
| **Student Reflection** | Students are able to explain how they grouped their objects and wrote corresponding equations. They are also given the opportunity to compare and contrast 2 digit equations with 3 digit equations. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

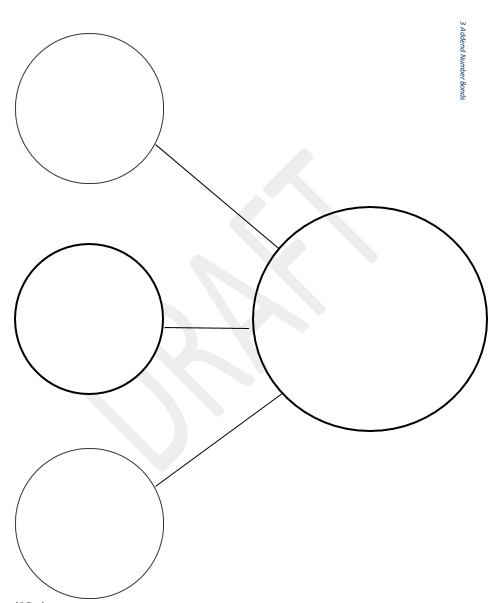
| **1st Grade Math Unit 3**  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- |
| **Understanding Place Value** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.NSBT.1** Extend the number sequence to:   a. count forward by ones to 120 starting at any number;  b. count by fives on multiples of 5 and 10, and tens to 100, starting at any number;  c. read, write and represent numbers to 100 using concrete models, standard form, and equations in expanded form;  d. read and write in word form numbers zero through nineteen, and multiples of ten through ninety.   * Individually and in sequence * One purpose for counting by groups (“unitizing”) is to make counting more efficient. * Teacher Note: Extend the number sequence as the year progresses. * **1.NSBT.2** Understand place value through 99 by demonstrating that:   1. ten ones can be thought of as a bundle (group) called a “ten”;      + Students need ample experiences with a variety of groupable materials that are proportional (e.g., groupable counters, linking cubes, links, beads) and ten frames allow students opportunities to create tens and break apart tens, rather than “trade” one for another. Since students’ first learning about place value concepts primarily rely on counting, the physical opportunity to build tens helps them to “see” that a “ten stick” has “ten items” within it. Pre-grouped materials (e.g., base ten blocks, bean sticks) are not introduced or used until a student has a firm understanding of composing and decomposing tens. (Van de Walle & Lovin, 2006)   2. the tens digit in a two-digit number represents the number of tens and the ones digit represents the number of ones;      + e.g., the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 refer to one, two, three, four, five, six, seven, eight, nine and ten tens (and 0 ones)   3. two-digit numbers can be decomposed in a variety of ways (e.g., 52 can be decomposed as 5 tens and 2 ones or 4 tens and 12 ones, etc.) and record the decomposition as an equation.      + Teacher Note: The respective equations recorded could be 52 = 50 + 2 or 52 = 40 + 12. Teachers may want to have students represent the decomposition with concrete models and drawings. * **1.NSBT.3** Compare two two-digit numbers based on the meanings of the tens and ones digits, using the words *greater than, equal to, or less than.*   + Students are not expected to use symbols in first grade (>, <, =).   + Teacher Note: Identify between which two tens any number within 100 falls. Use an open number line to plot any two-digit number in order to explain between which two tens the number falls. To integrate measurement, include temperature examples with comparison of two-digit numbers, in which the temperatures are provided by the teacher since students have not learned to read a thermometer – perhaps the teacher takes the temperature daily and applies in context. * **1.NSBT.5** Determine the number that is 10 more or 10 less than a given number through 99 and explain the reasoning verbally and with  multiple representations, including concrete models.   + Teacher Note: Teachers may want to begin by using concrete models as well as linear models such as a number line or a hundreds board to assist students as they learn the number pattern relationships. There are pitfalls of using a horizontal hundreds board, such as when you add 10, the value goes **up** but you move **down** on the board. As the students learn the relationship, they should be able to mentally determine the number without physical models. Students should be encouraged to share their process and strategy in finding the number. * **1.ATO.3** Apply Commutative and Associative Properties of Addition to find the sum (through 20) of two or three addends.   + Students should use concrete, pictorial, and verbal representations of the commutative property and associative property of addition when solving. It is not important that students know the property name, but the concept the property provides.   + Teacher note: Build on the concepts of number combinations explored in Unit 1. Students should begin to use symbols appropriately (i.e., +,-,=) within the combinations of the three quantities. * **1.ATO.5** Recognize how counting relates to addition and subtraction.   + Teachers will need to assist students in developing the relationship between counting and the operations of addition and subtraction. For example, skip counting forward or backward by 10. The teacher could use skip counting or counting on. May want to define counting on. The concept of missing addend may be used for subtraction. (Related to CC.1.OA.5 and CC1.NBT.6)   + Teacher Note: Use number lines as a visual of the number sequence. * **1.ATO.6** Demonstrate:   a. addition and subtraction through 20   * Students should use strategies such as counting on, making 10, decomposing a number leading to a 10 using the relationship between addition and subtraction, creating equivalent but easier known sums, doubles plus or minus one, counting back, and the commutative property. Understand the role of zero in addition and subtraction.   b. fluency with addition and related subtraction facts through 10.   * Fluency is defined as efficient, accurate, and flexible. Phases of operational understanding: construct operational meaning, develop reasoning strategies, and work toward quick recall.   + - Teacher Note: The NCTM Principles and Standards for School Mathematics defines **computational fluency** as having efficient, flexible, and accurate methods for computing. Computation fluency of “mathematical fluency” with whole numbers is an essential guide for school mathematics and forms the foundation for many higher level math concepts. * **1.ATO.8** Determine the missing number in addition and subtraction equations within 20.   + Students should use number sense as well as concrete and pictorial models such as number lines while identifying the missing whole number within at most a four term equation. |
| **New Academic Vocabulary for this Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * ones * tens * bundle | * place * value * digit | * equal to * less than * greater than | * unitize * multiple * hundred | * teen * decade number | |
| **Prior Knowledge Required for This Unit** |
| In Kindergarten, students develop concepts of how numbers can be composed and decomposed in a variety of ways, forming a foundation for number sense in base ten. Kindergarten students composed and decomposed numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and recording each composition or decomposition by a drawing; understanding that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.  Students were asked to unitize those ten individual ones as a whole unit: “one ten”. Students in Kindergarten explored the idea that the teen numbers (11 to 19) can be expressed as one ten and some leftover ones. Ample experiences with a variety of groupable materials that are proportional (e.g., cubes, links, beans, beads) and ten frames help students develop this concept. First graders will extend this concept in understanding place value through 99 demonstrating that two-digit numbers can be decomposed in a variety of ways and record the decomposition as an equation. |
| **Subsequent Knowledge Related to This Unit** |
| In Unit 3, students will develop conceptual understanding of place value through 99; this understanding will lead to students developing strategies for addition and subtraction based on place value in the next unit, Unit 4.  In first grade, students use concrete models to represent numbers up to 100 in expanded form. First graders also demonstrate that ten ones are thought of as a bundle. In second grade, students will use the correct terminology that 100 ones or 10 tens = one hundred (100).  First graders also learn to count forward by ones to 120; starting at any number as well as by 5’s on multiples of 5 and 10, and 10’s to 100, starting at any number. In second grade students will extend this knowledge in Unit 1 and are required to count by 10’s or 100’s starting at any number to 1,000.  It is essential that children develop a solid understanding of the base ten numeration system and place value concepts by the end of second grade. In third grade, students will then use knowledge of place value to round numbers to nearest 10’s and 100’s. They will also learn to multiply one-digit numbers by multiples of 10 using knowledge of place value. It is important that students develop place value concepts to use in rounding as well as for addition and subtraction because students are not expected to use addition and subtraction standard algorithms until fourth grade.  Students will *determine the number that is 10 more or 10 less than a given number through 99 and explain the reasoning verbally and with multiple representations, including concrete models* ***(1.NSBT.5).*** Using concrete models for 10 more and 10 less leads up to **1.NSBT.4.b** and **1.NSBT.6** in which students will add a two-digit number and a multiple of ten, and subtract a multiple of 10 from a larger multiple of 10 in the next unit, Unit 4. |
| **Relationship Among Standards in This Unit** |
| In Unit 3 students will build on their understanding of number concepts and relations, expanding their thinking towards place value concepts. The standards in this unit are clustered together with the intention of building a strong foundation of the base ten numeration system and place value concepts. Unit 3 will focus on developing an understanding of whole number relationships and place value through 99, including “making a ten” (grouping in tens and ones). Students will compare two-digit numbers (through 99) based on the meanings of the tens and ones to develop understanding of and solving problems involving their relative sizes. Students think of whole numbers between 10 and 100 in terms of tens and ones. They will understand the order of the counting numbers and their relative magnitudes while building number sense. Students will model 2-digit addition using concrete models, drawings, and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. **Teacher Note:** *In order for students to develop an understanding of place value concepts they will need ample opportunities to explore tens and ones groupings using concrete models and math drawings. Students need repeated experiences in building 2-digit numbers with strong visual support before extended place value concepts to add with 1-and 2-digit numbers.* |
|  |
| Create a mathematical classroom which encourages collaboration and builds community. A suggestion for developing World Class Skills a South Carolina student needs to be college and career ready is to:Provide settings within the mathematical classroom that promotes the use of ***Math Talk:***   * Frequently exchange mathematical ideas and problem solving strategies. * Children listen to understand one another. This involves thinking about what a person is saying so that you can explain it yourself or to help them explain it more clearly. It is not just being quiet when someone else is talking. Also, children need to listen so that they can ask a question or help the explainer. * Encourages critical thinking and problem solving, collaboration and teamwork, and knowing how to learn * Teachers can stand back or to the side of the classroom to encourage Math Talk as students interact more directly with each other.   **Activity: Counting in Groups** *(Van de Walle, p. 129)*  Find a collection of things that children might be interested in counting--perhaps the number of eyes in the classroom or the number of shoes, a mystery jar of buttons or cubes, a long chain of plastic links, or the number of crayons in the crayon box.  The quantity should be countable, somewhere between 25 and 100.  Pose the question, “How could we count our shoes in some way that would be easier than counting by ones?”  Whatever suggestions you get, try to implement them.  After trying several methods, you can have a discussion of what worked well and what did not.  If no one suggests counting by tens, you might casually suggest that as possibly another idea.  [**Grade 1 Module 2, Topic D:**](https://www.engageny.org/resource/grade-1-mathematics-module-2-topic-d) **Varied Problems Decompositions of Teen Numbers as 1 ten and Some Ones: Lessons 26-29**   * **1.NSBT.2, 1.NSBT.5, 1.ATO.1, 1.ATO.6** * Lesson 26: Identify 1 ten as a unit by renaming representations of 10 * Lesson 27: Solve addition and subtraction problems decomposing and composing teen numbers as 1 ten and some ones. * Lesson 28: Solve addition problems using ten as a unit, and write two-step solutions. * Lesson 29: Solve subtraction problems using ten as a unit, and write two-step solutions.   [**Grade 1 Module 4, Topic A: Tens and Ones: Lessons 1-6**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-a)**; 1.NSBT.1, 1.NSBT.2, 1.NSBT.5**   * Lesson 1: Compare the efficiency of counting by ones and counting by tens. * Lesson 2: Use the place value chart to record and name tens and ones within a two-digit number. * Lesson 3: Interpret two-digit numbers as either tens and some ones or as all ones. * Lesson 4: Write and interpret two-digit numbers as addition sentences that combine tens and ones. * Lesson 5: Identify 10 more, 10 less, 1 more, 1 less than a two-digit number. * Lesson 6: Use dimes and pennies as representations of tens and ones.   [**Lessons: Grade 1 Module 4, Topic B: Comparison of Pairs of Two-Digit Numbers: Lessons 7-8**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-b)**; 1.NSBT.3, 1.NSBT.2,**   * Lesson 7: Compare two quantities, and identify the greater or lesser of the two given numerals. * Lesson 8: Compare quantities and numerals from left to right.   **Understanding Place Value**   * [www.georgiastandards.org](https://www.georgiastandards.org/Georgia-Standards/Frameworks/1st-Math-Unit-5.pdf) * Refer to Tasks 1, 2, 4, and 5.   **Skip Counting With Counting Collections**   * [www.teachingchannel.org](https://www.teachingchannel.org/videos/skip-counting-with-kindergarteners) * Record strategies when skip counting by 5s and 10s   **Daily Activity: Flash Tens and Ones**:   * **Goal:** Show tens and ones * Write a 2-digit number on the board. Direct the class in showing this number by flashing ten fingers for each 10-group while counting by tens. Say, “freeze,” and then count by ones to show ones on fingers. Repeat several times with different numbers.   **Daily Activity: Number of the Day Stretch:**   * [https://books.google.com/books?id=vQDOAwAAQBAJ&pg=PA39&lpg=PA39&dq=number+of+the+day+stretch&source=bl&ots=wkvMTBeu4R&sig=\_YRGevESgrcZxoUPND6j74xDIS4&hl=en&sa=X&ved=0CB8Q6AEwAGoVChMI77DK\_76UxgIVg5WACh1nfACx#v=onepage&q=number% 20of%20the%20day%20stretch&f=false](https://books.google.com/books?id=vQDOAwAAQBAJ&amp;pg=PA39&amp;lpg=PA39&amp;dq=number%2Bof%2Bthe%2Bday%2Bstretch&amp;source=bl&amp;ots=wkvMTBeu4R&amp;sig=_YRGevESgrcZxoUPND6j74xDIS4&amp;hl=en&amp;sa=X&amp;ved=0CB8Q6AEwAGoVChMI77DK_76UxgIVg5WACh1nfACx%23v%3Donepage&amp;q=number%20of%20the%20day%20stretch&amp;f=false)   **Comparing Numbers:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/1/NBT/B/3/tasks/1102)  **Where Do I Go?:** [www.illustrativemathematics.org](https://www.illustrativemathematics.org/content-standards/1/NBT/B/3/tasks/682) |
| **Instructional Resources** |
| Teacher Resources:   * [**KATM Grade 1 Flipbook**:](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf) * Common Core Standards for Mathematics Flip Book Grade 1 * **Math Literature:**<http://www.the-best-childrens-books.org/math-for-kids.html> * **Building a Math Talk Community:**<http://www.eduplace.com/math/mthexp/pdf/mathtalk.pdf> * **Math Talk 101:**<http://www.scholastic.com/teachers/top-teaching/2014/01/math-talk-101> * **Math Talk: The importance; Why use it?**:<http://mathsolutions.com/common-core-support/math-talk/> * **Math Talk conversation starter posters:**<http://mason.gmu.edu/~jsuh4/teaching/resources/Buildingmathideas.pdf>   + The last two pages include an explanation of how to use Math Talk to build mathematical ideas and discourse.   **Teacher Resources for 1.NSBT. 5**   * + [Vertical 120 chart:](https://www.eduplace.com/math/mthexp/g1/visual/pdf/vs_g1_23.pdf)   + Teachers may want to use this hundreds board along with connecting cubes to assist students as they learn the number pattern relationships.   **Teacher Resources for 1.ATO.6.b:**  Resources for Interactive Sites:   * **Interactive Game:** [Understand Place Value:](http://www.mathchimp.com/1.2.2.php)   http://www.mathchimp.com/1.2.2.php   * **Interactive Game:** [Shark Numbers:](http://www.ictgames.com/sharkNumbers/sharkNumbers_v5.html)   http://www.ictgames.com/sharkNumbers/sharkNumbers\_v5.html   * + Count the base 10 blocks and identify the number. You can choose the magnitude of the numbers. * **Interactive Game**:<http://illuminations.nctm.org/Activity.aspx?id=3563>   + Independent of partner game in which students match whole numbers, shapes, fractions, or multiplication facts to equivalent representations.” * [**Math Spinner:**](http://www.senteacher.org/worksheet/13/Fractions.html)   http://www.senteacher.org/worksheet/13/Fractions.html   * This is a website where you can make exactly what you need. * **Virtual Manipulative:** * [An interactive number line](http://www.ictgames.com/numberlineJumpMaker/index.html)   http://www.ictgames.com/numberlineJumpMaker/index.html   * Students can practice using a jump strategy to find the distance between two numbers. * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** Number Blocks Freeplay.<http://www.mathsisfun.com/numbers/number-block-freeplay.html>   + Suggestion: Use in whole group instruction to model decomposing and composing numbers through 10. * **Teaching Tool:** Beadstring: <http://ictgames.com/brilliant_beadstring_with_colour.html>   + Choose one or two beadstrings. Practice bonds of 10 or 20, number facts to 10 or 20. * **Interactive Modeling Tool:** * Begin to recognize that 2 [digit numbers are made up of tens and units.](http://www.ictgames.com/partition.html)   http://www.ictgames.com/partition.html |
| **Assessing understanding of place value:**   * [Click on Mid-Module Assessment or End-of-Module Assessment](https://www.engageny.org/resource/grade-1-mathematics-module-2-topic-d) under Downloadable Resources for samples   https://www.engageny.org/resource/grade-1-mathematics-module-2  **Assessing extending the number sequence to read, write and represent numbers to 100 using concrete models, and standard form; and Assessing extending the number sequence to read and write in word form numbers zero through nineteen, and multiples of ten through ninety.**   * **Number of the Day Stretch:** A way to assess students’ number sense as well as their ability to represent numbers in multiple ways. Suggested questions to informally assess: * Why do you think it is important to be able to represent numbers in different ways? When do we usually use number words to represent numbers? When do we use numerals? When do we use pictures of diagrams? When do we use number sentences? Why do we sometimes choose one method of representation rather than another? * Teacher Note: This can also be assessed throughout the school year as the range of numbers increases within classroom instruction.   Return to [Table of Contents](#Table_of_Contents) |

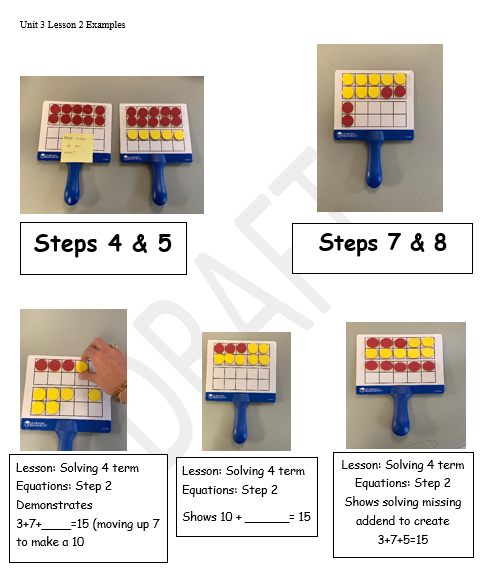
| **Course/Grade:**  1st grade  **Unit:**  Understanding Place Value | **Task Title:** Counting by Fives and Tens Starting at Any Number  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.1.b,d, 1.NSBT.2.c, 1.NSBT.3  1.ATO.5 Recognize how counting relates to addition and subtraction. |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 4d. Evaluate the reasonableness of a model and refine it if necessary. 3b. Compare and discuss the validity of various reasoning strategies. |
| **Materials and Resources** | Large demonstration 120 chart  Popsicle sticks  Expo markers  Dry Erase boards  Ten Frame  Individual 120 chart for each student |
| **Task Description** | ***This is an example of how counting by tens and fives can be extended to Place Value. They can be completed as stand-alone tasks or completed during Math Talks. These activities can be used daily throughout the school year.***   1. Use Tally Marks to represent the number of days we have been in school. The students will practice counting by 5s to determine the number of days in school. This will also give students practice in counting by ones from any number. Large ten frames could also be used every time a ten was created with the tally marks to allow students to see how two groups of 5 make a ten and to give students the opportunity to count by fives and tens. The teacher could also ask “Which way is the most efficient way to count larger numbers” and have students prove why their choice is the most efficient. 2. Using a 120 chart the teacher could have students identify a number by saying “I’m thinking of a number that has 4 tens and 2 ones.” The students will locate the correct number on the chart. The teacher will then extend this activity by stating “I’m looking for a number that is five more (or ten more) than a number that has 7 tens and 6 ones. This will allow students the opportunity to count by five or ten starting at any number. Later in the year this activity can be extended to ask this type of question “I’m thinking of a number that is 4 tens and 12 ones.” “I’m thinking of a number that is greater than 3 tens 7 ones but less than 6 tens 2 ones.” 3. The teacher will give the students a two digit number and the students would use their dry erase boards to represent the number with tally marks, ten frames, write the number in standard and expanded form, as well as word form.   **E-Learning Modification:** The teacher can continue to hold a daily math talk. Parents can be given questions that they can ask their child while they are watching the math talk. |
| **Equitable Access** | The activities are built upon daily. Students are allowed the opportunity to decide if they want to count by fives or tens. Numbers represented could be varied. Students could work with partners to come up with their own numbers to be represented.  **Early Entry Point:** Student can count using one-to-one.  **Foundational Entry Point:** Students use a number pattern to count from a given number, and represent number pattern using multiple representations that can include an expression/equation. |
| **Mathematical Vocabulary** | five  tens  ones  tally marks  ten frame  number chart  more  less  count on  skip count  standard form  word form  expanded form  bundle  digit  value |
| **Student Reflection** | Students are given the opportunity to discuss efficient ways to count and explain their thinking. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:**  Understanding Place Value | **Task Title:** Solving for Missing Number in Addition and Subtraction Through 20  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.ATO.6,  1.ATO.8 Determine the missing number in addition and subtraction equations within 20. |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 5a. Select and use appropriate tools when solving a mathematical problem. 7c. Look for structures to interpret meaning and develop solution strategies. |
| **Materials and Resources** | 3 Smaller Hula Hoops  1 Large Hula Hoop  Beanbags  Double Ten Frames  Counters  Wipe Boards  Dry Erase Markers  Number Lines  Rekenreks  3 addend number bonds |
| **Task Description** | Students have already had the opportunity to solve problems with missing numbers in Unit 2. This task will provide additional activities to practice solving missing number problems within 20 and determining when to add or subtract when given real-world context that is relevant to their lives.   1. The teacher will prompt students to recall adding and subtracting with Part-Part-Whole (number bonds) by using the hula hoops used in Units 1 and 2. 2. The teacher will ask students to help generate a list of key words that let them know if they should add or subtract to solve a specific problem (how many more, how many are left, how many altogether, difference, sum) 3. The teacher will then explain that they are going to use all of this knowledge to solve addition and subtraction equations with a double ten frame. 4. The teacher will present the following problem and ask students to think of a situation that can match this equation.   10 + \_\_\_\_\_\_ = 15.   1. The teacher will display a double ten frame and ask the students to explain how their ten frames should look with the information given in the equation.   The following is a link to [downloadable double ten frame](https://www.teacherspayteachers.com/Product/Double-Ten-Frame-Twenty-Frame-Building-Mats-376301)   1. The teacher will use student responses to fill in the double ten frame. She will then ask the students what needs to happen to solve the equation. (Possible leading questions: “Why do you think that?” “Can we prove this?” “Can anyone expand on what \_\_\_\_\_ said?” “Do you agree or disagree and why?” “Has anyone’s thinking changed?”) Student responses will be charted and tested. 2. The teacher will then present the following problem 12-\_\_\_\_=8 and ask if they can adapt their real-world situation to match the new equation. 3. Once again the students will be asked to explain how the double ten frame should look and then how they could use the frame to solve the problem. Notice the 10 as a set for place value understanding. Suggestions will be charted and tested. 4. After both problems have been solved, the teacher will ask the students to discuss similarities and differences between the two problems and how they were solved. 5. Students will then be given the opportunity to work with a partner to create and solve their own addition and subtraction problems using a double ten frame.   **E-Learning Modification:** Items from home can be used to solve the word problems. The teacher can send out copies of ten frames or students can use digital models to solve problems. Site for virtual ten frame: <https://apps.mathlearningcenter.org/number-frames/>  **Solving Four Term Equations:**   1. Review the previous tasks. Discuss how we know when to add or subtract and how a double ten frame can help us. 2. The teacher will then present the following equation: 3+7+\_\_\_\_\_\_\_\_= 15 Allow time for students to think of a real-world situation that can match the equation. 3. Demonstrate with students how to use friendly numbers (make ten) to solve as a strategy for mental computation (see attached picture) 4. The teacher will then give students a number within 20 and have the students either use a double ten frame, number line, rekenrek, or number bond to create a 4 term equation. 5. After students have solved their equations the group will reunite and share all of the different ways students made four term equations. |
| **Equitable Access** | Students get to use the strategy of their choice as well as the manipulatives they use.  **Early Entry Point:** Students can start exploring within10 then increase value as students gain accuracy and confidence.  **Foundational Entry Point:** Students can represent real-world situations that involve multi-steps operations and equations. |
| **Mathematical Vocabulary** | four term equation  addition (add)  subtraction (subtract)  double ten frame  counters  addend  subtrahend  friendly numbers |
| **Student Reflection** | Students get to share the method (strategy) they used to solve their equations. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

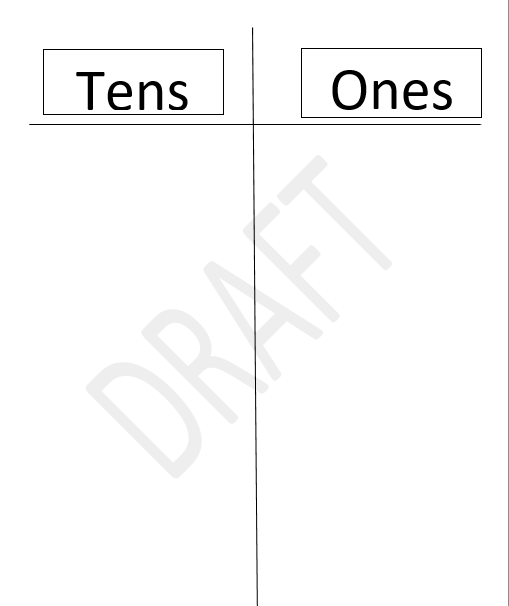




Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:** Understanding Place Value | **Task Title:** Making Bundles of 10  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.2 Understand place value through 99 by demonstrating that:  a. ten ones can be thought of as a bundle (group) called a “ten”;  b. the tens digit in a two-digit number represents the number of tens and the  one’s digit represents the number of ones;  c. two-digit numbers can be decomposed in a variety of ways (e.g., 52 can be  decomposed as 5 tens and 2 ones or 4 tens and 12 ones, etc.) and record the  decomposition as an equation. |
| **Mathematical Process Standards Addressed** | 7c. Look for structures to interpret meaning and develop solution strategies. 2b. Describe a given situation using multiple mathematical representations. 4b. Interpret mathematical models in the context of the situation. |
| **Materials and Resources** | Snap cubes  Counters  Place Value Blocks  Other materials that students can bundle into groups of 10  Yarn  Bowls  t-chart mats |
| **Task Description** | **Introducing Place Value**   1. The teacher will explain that today we are going to make a bundle of friends. 2. The teacher will have 10 students come to the front of the room. The teacher will count the students and then have them huddle together as they tie a piece of yarn loosely around the group. The teacher will then point out that we have a bundle of 10 students. 3. He/She will then ask the students if they think another bundle of 10 can be made with the students that are left and how do they know. 4. If possible the teacher will then call up 10 more students to make another bundle of 10 and then ask if yet another bundle of 10 can be made until no more sets of 10 are available to bundle. 5. The teacher will then point out that when we count our friends we have 2 bundles of 10 and some left over. 6. The teacher will then relate the bundle of friends to a bundle/stick of Snap cubes by having the students make 2 bundles/sticks of 10 and a pile of loose cubes to represent the number of students left over. 7. Ask the students what they notice about the Snap cubes and the bundle of friends. 8. The students will then work together with a bag of objects to see how many groups of 10 they can make by placing ten objects in a bowl (beads, glass marbles, straws, counters). 9. The students will then represent the same number with Snap cubes. 10. Once completed the students will share with the class how many groups of tens they made and how it relates to the Snap cubes they created. 11. The teacher will chart student responses that will be used in a later lesson. (3 tens and 4 more)   **E-Learning Modification:** Students can use like items from home to make bundles of 10.  **Introducing Place Value Blocks**  **(This can be done after students have multiple experiences with bundles of 10 using collection of objects)**   1. Using the chart created in the previous lesson choose a number that was created and represent the number with place value blocks. 2. Ask the students what they notice about the place value blocks and chart responses. 3. The teacher will point out how the place value blocks are another representation of bundles of 10 and some left over. 4. The teacher will introduce the terms tens and ones and show how these relate to digits in numbers by using a t-chart (first place the blocks on the chart and then write the numbers). See attached t-chart 5. The teacher can provide for students a t-chart and a baggie of place value blocks. She will then write a two digit number on the board and have the students build the number on their t-chart using their blocks. 6. Once the students have practiced this several times, partners will be able to make their own numbers and have the other partner name and write the number. 7. The teacher listen to students and discuss the numbers being made in each group. 8. These blocks can be placed in a work station with two digit number cards for continued practice. |
| **Equitable Access** | Students will be working with partners and making their own numbers.  **Early Entry Point:** Students can bundle and unbundle teen numbers into groups of ones and ten, then increase quantity as they become flexible in recognizing sets of ten.  **Foundational Entry Point:** Students can represent ten ones as a group of ten and decompose two digit numbers in a variety of way to include expressions showing expanded form. |
| **Mathematical Vocabulary** | group tens left over ones bundle tens and ones chart (t-chart) Place Value Blocks |
| **Student Reflection** | Students will explain their own model of objects and how it relates to the linking cubes. |

Return to [Table of Contents](#Grade_One_Table_of_Content)



Return to [Table of Contents](#Grade_One_Table_of_Content)

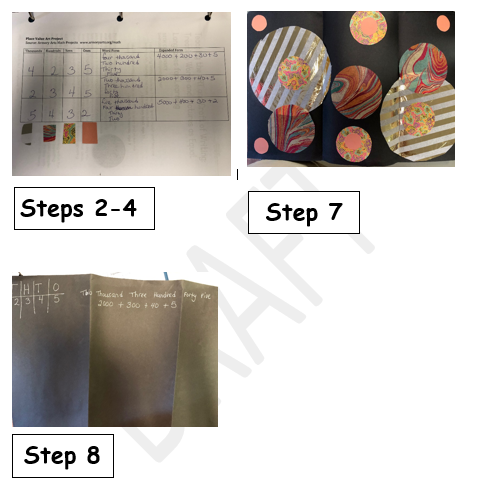
| **Course/Grade:**  1st grade  **Unit:**  Understanding Place Value | **Task Title:** Place Value Collage  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.2 Understand place value through 99 by demonstrating that:  a. ten ones can be thought of as a bundle (group) called a “ten”;  b. the tens digit in a two-digit number represents the number of tens and the ones digit represents the number of ones;  c. two-digit numbers can be decomposed in a variety of ways (e.g., 52 can be decomposed as 5 tens and 2 ones or 4 tens and 12 ones, etc.) and record the decomposition as an equation.  1.NSBT.3, 1.NSBT.5 |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 2b. Describe a given situation using multiple mathematical representations. 7a. Recognize complex mathematical objects as being composed of more than one simple object. |
| **Materials and Resources** | Recording template (See attached)  Various sizes of circles (bottle tops, paper plates, lids, etc)  colored dot stickers  Variety of scrapbook paper, tissue paper, construction paper, tag board, etc. (other items can be used….see picture of example)  12x18 or 9x12 construction paper  Crayons or markers  scissors and glue stick  This video link will show you an example of the [Place Value Collage](https://vimeo.com/90590246) being created. It is an example of a larger number but it will help you get the idea.  https://vimeo.com/90590246 |
| **Task Description** | ***Teacher can complete this activity first so there is a model to demonstrate with students. Students need multiple experienced decomposing two-digit numbers to discover how base-ten system supports place-value.***  1. Students will apply their knowledge of place value into a visual representation. Teacher will give each student a recording chart (See attached).  2. Students will choose a number 0-9 to write in the tens and 0-9 digit for the ones (cannot repeat the number).Then Students will write that number in word form (3rd column) and Expanded Form (4th column). ***(See Attached)***  3. Students will use the same digits and make a new number under the first number. Then *write and say* the new number in word and expanded form. ***(see attached for clarification)***  4. Next, Students will choose 2 different patterned paper and cut a very small sample under the tens and small sample of 2nd paper under ones. Students will choose which number they want to represent in the collage. Have students circle their chosen number. ***(See attached)***  5. The teacher will show the students a wide variety of circle templates (bottle tops, paper cups, lids, bowls, and paper plates) and ask the students for suggestions of combinations that could be used to represent tens and ones and to justify their answers. Students will choose 2 circle templates, one larger than the other. The larger circle will represent the tens digit, and the smaller circle will represent the ones.  6. Students will use large circle to trace that number of circles for the tens onto their selected paper. S will do the same for the ones digit. ***(Ex: 35 will have 3 large circles on one color paper and 5 smaller circles on a different colored paper)***.  7. Students will then cut out their circles and glue onto construction paper ***(See Attached).***  8. Students will try to write on the back of their paper their number multiple forms that can include using digits, word form and expanded form  9. Then students will get in partner groups to guess each other’s number and compare numbers to decide which number is greater than and less than. They will also decide which number is 10 more and 10 less than the number they created. After 2 minutes, students can go to a different partner and do the same--guess each number and decide the greater and less number. Teacher can have them repeat this as time permits.  Extension: Have students relate their collage to place value blocks. For those that can explain how each place value is represented with accuracy and confidence, challenge them to add hundreds then thousands.  *Adapted from: Armory Arts Math Projects* [*www.armoryarts.org/math*](http://www.armoryarts.org/math)  **E-Learning Modification:** Students can use household items such as candy to create the number and then upload a picture of the finished collage to a district approved platform and have other students comment on what they think the number is that is being represented. |
| **Equitable Access** | Students choose their own number to create.  **Early Entry Point:** Student can use a teen number to represent as a collage and add more tens once they can flexibly represent tens and ones.  **Foundational Entry Point:** Students can represent ten ones as a group of ten and decompose two digit numbers in a variety of way to include expressions showing expanded form. |
| **Mathematical Vocabulary** | Tens  Ones  Digit  Value  greater than  less than  equal to  word form  expanded form  standard form |
| **Student Reflection** | Students will have to explain their collage and how it relates to place value and place value blocks. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

|  |  |  |  |
| --- | --- | --- | --- |
| TENS | ONES | WORD FORM | EXPANDED FORM |
|  |  |  |  |
|  |  |  |  |
| Paper Sample | Paper Sample |  |  |

Recording template

***This is an example of illustrating up to the thousands place.***



This is an example of how you can use different materials to show place value. This project was done in December and candy canes where used. Small candy canes represent the ones place, larger candy canes represent the tens place and colored candy canes represent the hundreds.

(SCDE 2020)

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **1st Grade Math Unit 4**  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- |
| **Applying Place Value Concepts** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.NSBT.4** Add through 99 using concrete models, drawings, and strategies based on place value to:   1. add a two-digit number and a one-digit number, understanding that sometimes it is necessary to compose a ten (regroup)   2. add a two-digit number and a multiple of 10. * **1.NSBT.6** Subtract a multiple of 10 from a larger multiple of 10, both in the range 10 to 90, using concrete models, drawings, and strategies based on place value. * **1.ATO.2** Solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20.   + Teacher Note: Students should use concrete objects, pictorial models, and number sentences when solving problems. |
| **New Academic Vocabulary for This Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * group * regroup | * place value * two-digit | * counting on * make-a-ten |  |  | |
| **Prior Knowledge Required for This Unit** |
| Before moving into Unit 4, students need to have a strong understanding of number concepts and relations begun in Kindergarten and repeated in first grade Unit 1. It is essential for students to know how to independently decompose two-digit numbers through 99 and record the decomposition as an equation before beginning Unit 4. Students need to have an understanding of the concepts of addition and subtraction and understand the meaning of the operations and the actions it takes to make a group larger, smaller, and on number relations and comparisons.  Students will develop strategies for adding whole numbers through 99 and subtracting multiples of 10 based on their prior work with smaller numbers in Units 1-3. Students need to understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two, adding 10 is the same thing as counting by tens). Students will continue to develop and extend the strategies they have learned for unknowns-(result, change, start) in addition and subtraction problems. Problem types, models, and drawings are all intertwined together in this unit so students can access prior knowledge as they work with greater numbers and quantities. (**As a means of support and for reference during this unit 4, standards 1.ATO.1, 1.ATO.2, 1.ATO.3, 1.ATO.5, 1.ATO.6, 1.ATO.8 are repeated in italics within the list of standards on the overview page for this unit because, prior to beginning this unit 4, students should have addressed those standards which require adding and subtracting within 20 and use of the commutative and associate properties when adding.)**  In Kindergarten, students were introduced to composing and decomposing numbers 11-19 separating tens and ones from the remaining ones using objects and drawings **(K.NSBT.1)**. In Unit 3, first graders extended this concept in understanding place value through 99 demonstrating that two-digit numbers can be decomposed in a variety of ways and recorded the decomposition as an equation **(1.NSBT.2.c)**. Students also continued to develop a conceptual understanding of whole number relationships and place value through 99, including “making a ten” (grouping in tens and ones) in Unit 3 **(1.NSBT.2)**. Students compared two-digit numbers (through 99) based on the meanings of the tens and ones developing an understanding of and solving problems involving their relative sizes **(1.NSBT.3)**. Students were introduced to thinking of whole numbers between 10 and 99 in terms of tens and ones. They developed an understanding of the order of the counting numbers and their relative magnitudes while continuing to build number sense **(1.NSBT.1)**. Students should be able to determine the number that is 10 more or 10 less than a given number through 99 and explain the reasoning verbally and with multiple representations, including concrete models **(1.NSBT.5)**. |
| **Subsequent Knowledge Related to This Unit** |
| It is essential that children develop a solid understanding of the base ten numeration system and place value concepts by the end of second grade. In third grade, students will then use knowledge of place value to round numbers to nearest 10’s and 100’s. They will also learn to multiply one-digit numbers by multiples of 10 using knowledge of place value. It is important that students develop place value concepts to use in rounding as well as for addition and subtraction because students are not expected to use addition and subtraction standard algorithms until fourth grade. |
| **Relationship Among Standards in This Unit** |
| Unit 4 will focus on students developing, discussing, and using efficient, accurate, and generalizable methods to add through 99 using concrete models, drawings, and strategies based on place value to add a two-digit number and a one-digit number, understanding that sometimes it is necessary to compose a ten (regroup) (**1.NSBT.4.a)**, and to add a two-digit number and a multiple of 10 (**1.NSBT.4.b).** Students will subtract a multiple of 10 from a larger multiple of 10, both in the range 10 to 90, using concrete models, drawings, and strategies based on place value **(1.NSBT.6**).  Standards are repeated with the intention of extending the range of numbers within as you progress through the year. Standards should not be taught in isolation nor are students expected to show mastery of the standard by the end of a given unit. Students need opportunities for investigations, discussions, hands on explorations, visual models, stories problems, and time to explore concepts. Students will continue to develop and extend the strategies they have learned for unknowns-(result, change, start) in addition and subtraction problems. Problem types, models, and drawings are all intertwined together in this unit so students can access prior knowledge (sums and differences less than 20) as they work with greater numbers and quantities. Those sums and differences less than 20 are addressed in the following standards which will be referenced as support and prerequisites to the standards in this unit that require sums and differences greater than 20:   * Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions. **(1.ATO.1)** * Students will solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20. **(1.ATO.2)** * Apply Commutative and Associative Properties of Addition to find the sum (through 20) of two or three addends. **(1.ATO.3)**  *Students should use concrete, pictorial, and verbal representations of the commutative property and associative property of addition when solving. It is not important that students know the property name, but the concept the property provides.* * Recognize how counting relates to addition and subtraction. **(1.ATO.5)** * Demonstrate addition and subtraction through 20. **(1.ATO.6.a)** *Students should use strategies such as counting on, making 10, decomposing a number leading to a 10 using the relationship between addition and subtraction, creating equivalent but easier known sums, doubles plus or minus one, counting back, and the commutative property. Understand the role of zero in addition and subtraction.* * Demonstrate fluency with addition and related subtraction facts through 10. **(1.ATO.6.b)** * Determine the missing number in addition and subtraction equations within 20. **(1.ATO.8)** |
|  |
| Introductory Lesson:  **Lessons:** [**Grade 1 Module 4, Topic C: Addition and Subtraction of Tens: Lessons 11-12**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-c)**; 1.NSBT.4, 1.NSBT.6**   * Lesson 11: Add and subtract tens from a multiple of 10. * Lesson 12: Add tens to a two-digit number.   [**Lessons: Grade 1 Module 4, Topic D: Addition of Tens or Ones to a Two-Digit Number: Lessons 13-18;**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-d) **1.NSBT.4, 1.NSBT.6**   * Lessons 13-14: Use counting on and the make ten strategy when adding across a ten * Lesson 15: Use single-digit sums to support solutions for analogous sums to 40. * Lessons 16-17: Add ones and ones or tens and tens. * Lesson 18: Share and critique peer strategies for adding two-digit numbers.   [**Lessons: Grade 1 Module 4, Topic E: Lessons 19-22**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-e)**; 1.NSBT.4, 1.NSBT.6, 1.ATO.1**   * Lesson 19: Use tape diagrams as representations to solve put together/take apart with total unknown and add to with result unknown word problems. * Lessons 20-21: Recognize and make use of part-whole relationship within tape diagrams when solving a variety of problem types. * Lesson 22: Write word problems of varied types.   [**Lessons: Grade 1 Module 4, Topic F: Lessons 23-27**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-f)**; 1.NSBT.4, 1.NSBT.2, 1.NSBT.6, 1.ATO.1**   * Lesson 23: Interpret two-digit numbers as tens and ones, including cases with more than 9 ones. * Lessons 24-25: Add a pair of two-digit numbers when the ones digits have a sum less than or equal to 10 * Lessons 26-27: Add a pair of two-digit numbers when the ones digits have a sum greater than 10.   [**Lessons: Understanding Place Value:**](https://www.georgiastandards.org/Georgia-Standards/Frameworks/1st-Math-Unit-5.pdf) **1.NSBT.4, 1.NSBT.2, 1.NSBT.3, 1.NSBT.6, 1.ATO.1, 1.ATO.2**   * Refer to Tasks 3, 6, 7, 9, 10, 11, 12, 13, 14, 15   **Lesson:** [**Sugar, Sugar!:**](http://betterlesson.com/lesson/568903/sugar-sugar) **1.NSBT.4**   * Students explore how they could arrange their cubes to solve story problems with numbers on the decade. **Daily Activity:** [**Number Talk: Rename That Number**](http://www.insidemathematics.org/classroom-videos/number-talks/1st-grade-math-rename-number/number-talk)   http://www.insidemathematics.org/classroom-videos/number-talks/1st-grade-math-rename-number/number-talk   * Find different number sentences that represent a given two-digit number in as many ways as possible.   **Daily Activity: Flash Tens and Ones**:   * **Goal:** Show tens and ones * Write a 2-digit number on the board. Direct the class in showing this number by flashing ten fingers for each 10-group while counting by tens. Say, “freeze,” and then count by ones to show ones on fingers. Repeat several times with different numbers.   **Daily Activity: Number of the Day Stretch:**   * [https://books.google.com/books?id=vQDOAwAAQBAJ&pg=PA39&lpg=PA39&dq=number+of+the+day+stretch&source=bl&ots=wkvMTBeu4R&sig=\_YRGevESgrcZxoUPND6j74xDIS4&hl=en&sa=X&ved=0CB8Q6AEwAGoVChMI77DK\_76UxgIVg5WACh1nfACx#v=onepage&q=number% 20of%20the%20day%20stretch&f=false](https://books.google.com/books?id=vQDOAwAAQBAJ&amp;pg=PA39&amp;lpg=PA39&amp;dq=number%2Bof%2Bthe%2Bday%2Bstretch&amp;source=bl&amp;ots=wkvMTBeu4R&amp;sig=_YRGevESgrcZxoUPND6j74xDIS4&amp;hl=en&amp;sa=X&amp;ved=0CB8Q6AEwAGoVChMI77DK_76UxgIVg5WACh1nfACx%23v%3Donepage&amp;q=number%20of%20the%20day%20stretch&amp;f=false)   **Number Senses Routine:** [**Choral Counting Activities:**](https://drive.google.com/file/d/0B51D5rAdKSXUMFpLYm1MSVpzSGc/edit)  https://drive.google.com/file/d/0B51D5rAdKSXUMFpLYm1MSVpzSGc/edit   * Whole-class choral counting activities include counting by ones, tens, fives, twos starting at zero and then starting at other numbers, counting by tens starting from 53 or 320, counting backwards by ones or tens.   **Leprechaun Traps:** [**Addition Within 100**](https://www.teachingchannel.org/videos/grade-1-math)  https://www.teachingchannel.org/videos/grade-1-math   * Use multiple strategies to solve addition problems   **Lessons:** [**Grade 1 Module 4, Topic F: Lessons 29;**](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-f-lesson-29) **1.NSBT.4, 1.NSBT.2, 1.NSBT.6, 1.ATO.1, 1.ATO.6**   * Lesson 29: Add a pair of two-digit numbers with varied sums in the ones. |
| **Instructional Resources** |
| Teacher Resources:   * [**Number Sense Routines by Shumway:**](https://www.stenhouse.com/sites/default/files/public/legacy/pdfs/numbersense_ch2.pdf)   https://www.stenhouse.com/sites/default/files/public/legacy/pdfs/numbersense\_ch2.pdf   * Chapter 2: Improving Number Sense * **Choral Counting Activities:**  [Choral Counting Activities](https://drive.google.com/file/d/0B51D5rAdKSXUMFpLYm1MSVpzSGc/edit) * [**KATM Grade 1 Flipbook**:](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf) * Common Core Standards for Mathematics Flip Book Grade 1 * **Building a Math Talk Community:**<http://www.eduplace.com/math/mthexp/pdf/mathtalk.pdf> * **Math Talk: The importance; Why use it?**:<http://mathsolutions.com/common-core-support/math-talk/> * [**Math Talk conversation starter posters:**](http://mason.gmu.edu/~jsuh4/teaching/resources/Buildingmathideas.pdf) http://mason.gmu.edu/~jsuh4/teaching/resources/Buildingmathideas.pdf   + The last two pages include an explanation of how to use Math Talk to build mathematical ideas and discourse.   Resources for 1.NSBT. 4:   * **Counting Collections to 100 Video:** [https://www.teachingchannel.org/videos/counting-by-ten-lesson](https://www.teachingchannel.org/videos/counting-by-ten-lesson%20) * **Lucky Six:** [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/) * **Add a Multiple of 10:** [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/) * [**120 chart (Vertical):**](https://www.eduplace.com/math/mthexp/g1/visual/pdf/vs_g1_23.pdf)  https://www.eduplace.com/math/mthexp/g1/visual/pdf/vs\_g1\_23.pdf   + Teachers may want to use this hundreds board along with connecting cubes to assist students as they learn the number pattern relationships. * **Virtual Manipulative:** [Number Line Arithmetic](http://nlvm.usu.edu/en/nav/frames_asid_156_g_1_t_1.html):   http://nlvm.usu.edu/en/nav/frames\_asid\_156\_g\_1\_t\_1.html   * This resource can be used for to picture whole number operations; addition, subtraction, ~~multiplication, division~~ carried out on a number line. * **Interactive Game:** [Understand Place Value:](http://www.mathchimp.com/1.2.2.php)   http://www.mathchimp.com/1.2.2.php   * **Interactive Game**:<http://illuminations.nctm.org/Activity.aspx?id=3563>   + “Independent of partner game in which students match whole numbers, shapes, fractions, or multiplication facts to equivalent representations.” * [**Math Spinner**](http://www.senteacher.org/worksheet/13/Fractions.html)**:**   http://www.senteacher.org/worksheet/13/Fractions.html   * This is a website where you can make exactly what you need. * **Virtual Manipulative:** http://www.ictgames.com/numberlineJumpMaker/index.html * [An interactive number line](http://www.ictgames.com/numberlineJumpMaker/index.html) * Students can practice using a jump strategy to find the distance between two numbers. * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e., Game Boards, Story Boards, Work mats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** Number Blocks Freeplay:<http://www.mathsisfun.com/numbers/number-block-freeplay.html>   + Suggestion: Use in whole group instruction to model decomposing and composing numbers through 10. * **Teaching Tool:** Beadstring: <http://ictgames.com/brilliant_beadstring_with_colour.html>   + Choose one or two beadstrings. Practice bonds of 10 or 20, number facts to 10 or 20. * **Interactive Modeling Tool:** http://www.ictgames.com/partition.html * Begin to recognize that [2 digit numbers are made up of tens and units](http://www.ictgames.com/partition.html). |
| **Assessing understanding of place value:**   * [Click on Mid-Module Assessment or End-of-Module Assessment](https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-f-lesson-29) under Downloadable Resources for samples   **Assessing extending the number sequence to read, write and represent numbers to 100 using concrete models, and standard form; and Assessing extending the number sequence to read and write in word form numbers zero through nineteen, and multiples of ten through ninety.**   * **Number of the Day Stretch:** A way to assess students’ number sense as well as their ability to represent numbers in multiple ways. Suggested questions to informally assess: * Why do you think it is important to be able to represent numbers in different ways? When do we usually use number words to represent numbers? When do we use numerals? When do we use pictures of diagrams? When do we use number sentences? Why do we sometimes choose one method of representation rather than another? * Teacher Note: This can also be assessed throughout the school year as the range of numbers increases within classroom instruction. |

Return to [Table of Contents](#Table_of_Contents)

| **Course/Grade:**  1st grade  **Unit:**  Applying Place Value Concepts | **Task Title:** Addition and Subtracting Multiples of 10 with 120 Chart  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.4.b,  1.NSBT.6 Subtract a multiple of 10 from a larger multiple of 10, both in the range 10 to 90,  using concrete models, drawings, and strategies based on place value. |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 2a. Make sense of quantities and their relationships in mathematical and real-world situations. 7b. Recognize mathematical repetition in order to make generalizations. |
| **Materials and Resources** | Demonstration 120 chart  Individual 120 chart for each student |
| **Task Description** | **Subtracting multiples of 10**   1. The teacher will show the students at large 120 chart. The teacher will review with the students what they have already learned about the 120 chart. 2. The teacher will highlight the number 50 on the chart. The teacher will ask the students to predict where they will end up if they count back 10 places. 3. The teacher will model counting back 10 as the students follow along on their own charts. 4. Once the teacher reaches 40 the following questions will be asked: “What did you notice? Is there a quicker way for us to get here? What relationship do you notice between the two numbers 40 and 50? 5. The teacher will chart student responses and then test responses with another ten number. 6. The teacher will ask “What can we conclude from this activity? How could we show our findings with an equation?” Where would we end up if we started at 50 again but this time counted back 20?” 7. Students will then work with a partner starting at any 10 number and counting back in multiples of 10 and writing the correlating equation. 8. To conclude the lesson, the teacher will pose the following questions “If our equation is 70-30= how many rows would we have to move?” The teacher would then show the equations 7-3=4 and 70-30=40 and ask “How are these equations related?” and “So what do you think 700-300 would equal?” “What patterns do you notice?”   **Addition with multiples of 10**   1. The teacher will show the students at large 120 chart. The teacher will review with the students what they have already learned about the 120 chart and how to subtract multiples of 10. 2. The teacher will highlight the number 54 on the chart. The teacher will ask the students to predict where they will end up if they count forward 10 places. 3. The teacher will model counting forward 10 as the students follow along on their own charts. 4. Once the teacher reaches 64 the following questions will be asked: “What did you notice? Is there a quicker way for us to get here? What relationship do you notice between the two numbers 54 and 64? 5. The teacher will chart student responses and then test responses with another two digit number. 6. The teacher will ask “What can we conclude from this activity? How could we show our findings with an equation?” Where would we end up if we started at 54 again but this time counted forward 20?” 7. Students will then work with a partner starting at any two digit number and counting forward in multiples of 10 and writing the correlating equation. 8. To conclude the lesson, the teacher will pose the following questions “If our equation is 36+30= how many rows would we have to move and in which direction?” The teacher would then show the equations 6+3=9 and 60+30=90 and ask “How are these equations related?” and “So what do you think 600+300 would equal?” “What patterns do you notice?”   Extension Activity:  “If we start at 70 and end at 20, did we add or subtract? How do you know?”  “If we start at 37 and end at 97, did we add or subtract? How do you know?”  **E-Learning Modification:** Students can be provided a digital 120 chart and provide parents with questions to ask the students. |
| **Equitable Access** | Students are following along with the teacher on their own 120 chart. During partner work, the students choose their own starting point.  **Early Entry Point:** Students can count by one fluently to reach the given number.  **Foundational Entry Point:** Students can use place value concepts to determine the number that is 10 more or 10 less and represent it mathematically using models and equations. |
| **Mathematical Vocabulary** | Addition Subtraction forwards backwards two-digit number |
| **Student Reflection** | Students are given the opportunity to explain their thinking and justify answers while transferring learning to unlimited two digit numbers. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

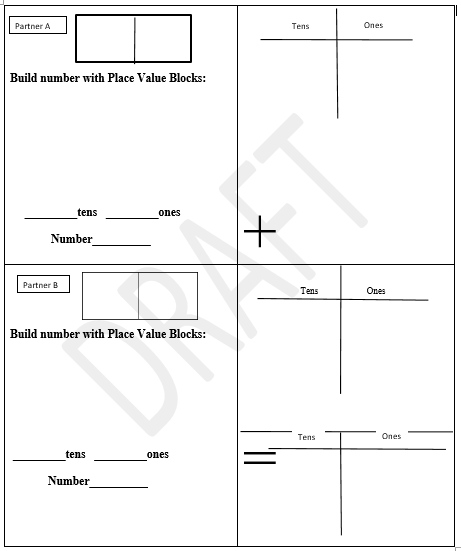


(SCDE 2020)

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**1st grade  **Unit:**  Applying Place Value Concepts | **Task Title:** Domino Addition with Regrouping  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.NSBT.4Add through 99 using concrete models, drawings, and strategies based on place value to: a. add a two-digit number and a one-digit number, understanding that sometimes it is necessary to compose a ten (regroup); b. add a two-digit number and a multiple of 10. 1.ATO.2 |
| **Mathematical Process Standards Addressed** | 1c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. 3a. Construct an justify a solution to a problem. 4a. Identify relevant quantities and develop a model to describe their relationships. |
| **Materials and Resources** | Dominoes  If real dominoes are not available, the template below can be used:  [Domino template](https://lrt.ednet.ns.ca/PD/BLM/pdf_files/number/dominoes.pdf)  Recording Sheet  Place Value Blocks |
| **Task Description** | 1. Students will watch the [BrainPopJr video on regrouping](https://jr.brainpop.com/math/additionandsubtraction/addingwithregrouping/).   https://jr.brainpop.com/math/additionandsubtraction/addingwithregrouping/   1. Students will then work together in pairs to practice addition with regrouping. 2. Each group will receive 2 dominos (see template), place value blocks and a recording sheet. 3. Students will turn the domino horizontally and the dots will represent their number (See attached). 4. Students will then use place value blocks to build the number represented on the dominoes. They will record this information on the recording sheet. 5. Students will then write an addition problem adding the two numbers together and record on sheet. 6. Students will then manipulate the place value blocks to add the two numbers together and exchange a group of 10 ones to make a ten. 7. The sum will be recorded on the answer sheet. 8. Students can then choose two different dominoes and repeat the activity if time permits. 9. These materials will then be placed in a work station for further practice.   **E-Learning Modification:** If students do not have dominoes at home they can use the provided template. The template and questions can also be uploaded to district approved platform so students can interact and engage in conversation.  Extension:  Students can create real world word problems to go with the equations created with the dominoes.  Guiding Questions:   1. Can you write your equation a different way and solve it? What do you notice about the sum and why do you think this happens? 2. What would happen if you have 3 dominoes? 3. Why can’t you write a two digit number in the ones place and how can you fix it? |
| **Equitable Access** | Students are working with a partner for support and feedback. Partners can also check each other’s work and compare the two numbers to determine which number has more tens or ones, which number is greater or which number is less and explain why. They are choosing a domino to represent their number and are not having to come up with a number on their own.  **Early Entry Point:** Student can use counting by one to generate sums  **Foundational Entry Point:** Students can represent sums using equations and multiple representations given real-world situations. |
| **Mathematical Vocabulary** | regrouping tens ones sum addition commutative property |
| **Student Reflection** | Students will have to determine what to do when there are more than 9 ones. |

Return to [Table of Contents](#Grade_One_Table_of_Content)



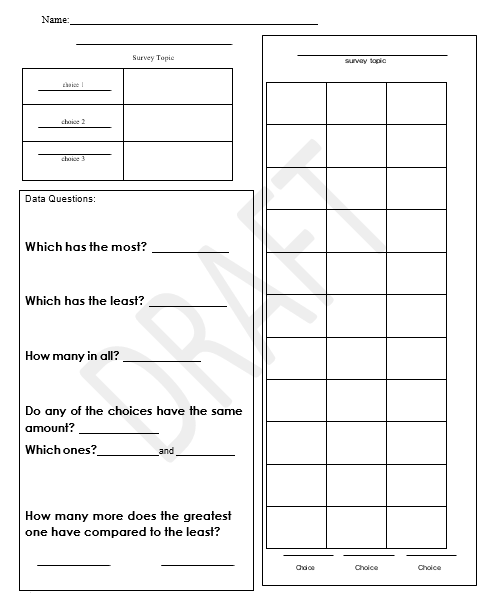
Return to [Table of Contents](#Grade_One_Table_of_Content)

| **1st Grade Math Unit 5** Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- |
| **Comparisons and Data** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.MDA.4** Collect, organize, and represent data with up to 3 categories using object graphs, picture graphs, t-charts and tallies.   + *Object graphs* use the actual objects being graphed. Each item can be placed in a square so that comparisons and counts are easily made. Examples include types of shoes, seashells, and books. (Teaching Student-Centered Mathematics Grades K-3 John Van de Walle, 2006)   + *Picture graphs* use drawings that represent what is being graphed. Students can make their own drawings, or you can duplicate drawings to be colored or cut out to suit particular needs. (Teaching Student-Centered Mathematics Grades K-3 John Van de Walle, 2006)   + Teacher Note: The teacher will create graphs at the beginning of the year and move to group creations of graphs. By the end of the school year, students should be able to create graphs on their own. The teacher will provide the framework for data organization. * **1.MDA.5** Draw conclusions from given object graphs, picture graphs, t-charts, tallies, and bar graphs.   + Ask and answer questions: how many in each category, how many more or less in one category than another. Bar graphs are included, but students are not expected to create their own. * **1.ATO.1** Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions. * **1.ATO.2** Solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20.   + Teacher Note: Students should use concrete objects, pictorial models, and number sentences when solving problems. * **1.ATO.9** Create, extend and explain using pictures and words for: * growing patterns (between 2 and 4 terms/figures). |
| **New Academic Vocabulary for this Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * sort * alike * different * after | * unit * compare * tally * before | * data * organize * order * most | * order * data * organize * least | * short * shorter * tall * taller | |
| **Prior Knowledge Required for This Unit** |
| In kindergarten students were introduced to counting quantities and comparing quantities. First grade units 1-4 build on the foundation set in kindergarten. Students will continue to build on their knowledge of representing and analyzing data. In kindergarten, students created picture graphs from which they drew conclusions. (*K.MDA.4 Represent data using object and picture graphs, and draw conclusions from the graphs*.)  In first grade, students move to collecting and representing data with up to 3 categories. (*1.MDA.4 Collect, organize, and represent data with up to 3 categories using object graphs, picture graphs, t-charts and tallies.).* |
| **Subsequent Knowledge Related to This Unit** |
| In second grade, students will collect, organize, and represent data in 4 categories, as well as generate data about measurements, and represent their findings on a line plot. |
| **Relationship Among Standards in This Unit** |
| Unit 5 will focus on students organizing, representing, interpreting, and comparing data. Unit 5 will build on what students know about comparing numbers to develop comparison statements for a set of data and solve comparison story problems. |
| **Instructional Resources** |
| * **KATM** [**Grade 1 Flipbook**:](http://www.katm.org/flipbooks/1%20FlipBook%20Final%20CCSS%202014.pdf) * Common Core Standards for Mathematics Flip Book Grade 1 * **Interactive Game:** Interpreting data:<http://www.bbc.co.uk/bitesize/ks2/maths/data/interpreting_data/play/> * This activity will show you how to interpret data. * **Interactive Game:** [Bar Graph Sorter](http://www.shodor.org/interactivate/activities/BarGraphSorter/):   http://www.shodor.org/interactivate/activities/BarGraphSorter/   * [**Create a Graph:**](http://nces.ed.gov/nceskids/createagraph/default.aspx?ID=5cfc5f8e9e4345108c22d60c40ba6072)   http://nces.ed.gov/nceskids/createagraph/default.aspx?ID=5cfc5f8e9e4345108c22d60c40ba6072  [**Grade 1 Module 6, Topic A: Lessons 1-2**](https://www.engageny.org/resource/grade-1-mathematics-module-6-topic)**; 1.ATO.1**  https://www.engageny.org/resource/grade-1-mathematics-module-6-topic   * [Lesson 1: Solve *compare with difference unknown* problem types.](https://www.engageny.org/resource/grade-1-mathematics-module-6-topic-lesson-1) * [Lessons 2: Solve *compare with bigger or smaller unknown* problem types.](https://www.engageny.org/resource/grade-1-mathematics-module-6-topic-lesson-2)   **Grade 1 Module 3, Topic D:** Data Interpretation: **Lessons 10-11; 1.ATO.1, 1.MDA.4, 1.MDA.5**   * <https://www.engageny.org/resource/grade-1-mathematics-module-3-topic-c> * Lesson 10-11: Collect, sort, and organize data; then ask and answer questions about the number of data points.   [**Favorite Ice Cream Flavor**](https://www.illustrativemathematics.org/content-standards/1/MD/C/4/tasks/506)**;** **1.MDA.4, 1.MDA.5**   * *“The purpose of this task is for students to represent and interpret categorical data.”* * Which has fewer? [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/) * Duck/Rabbit [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/)   Resources for Interactive Sites:   * [**Math Spinner**](http://www.senteacher.org/worksheet/13/Fractions.html)**:**   http://www.senteacher.org/worksheet/13/Fractions.html   * This is a website where you can make exactly what you need. * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** [Number Blocks Freeplay:](http://www.mathsisfun.com/numbers/number-block-freeplay.html)  http://www.mathsisfun.com/numbers/number-block-freeplay.html |
| **Tasks/Questions** |
| **Example of comparison problems:**   * *Tamar has 12 coins. Willie has 8 coins. How many more coins does Tamar have than Willie?* * *16 coins are on the table. 11 of them are pennies and the rest are dimes. How many dimes are there?* * *Peter has 6 fewer coins than Niki. Niki has 9 coins. How many coins does Peter have?* |

Return to [Table of Contents](#Table_of_Contents)

| **Course/Grade:**  1st grade  **Unit:**  Comparisons and Data | **Task Title:** Graphing and Data  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.MDA.4 Collect, organize, and represent data with up to 3 categories using object graphs, picture graphs, t-charts and tallies. 1. MDA.5 Draw conclusions from given object graphs, picture graphs, t-charts, tallies, and bar graphs.  1. ATO.1 Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions.  1. ATO.2 Solve real-world/story problems that include three whole number addends whose sum is less than or equal to 20. |
| **Mathematical Process Standards Addressed** | 2a. Make sense of quantities and their relationships in mathematical and real-world situations. 2b. Describe a given situation using multiple mathematical representations. 4a. Identify relevant quantities and develop a model to describe their relationships. |
| **Materials and Resources** | Data sheet |
| **Task Description** | Students will decide on a survey question and three data choices (examples favorite fruit, favorite ice cream flavor, favorite sport, etc.) Students who need assistance in deciding their survey question and three data choices may be given teacher assistance.  Students will survey their classmates (Teacher can scaffold how many people need to be surveyed) and complete tally chart as they collect their data.  Students will turn tally chart into a bar graph.  Students will use the graph to answer questions such as:  Which has the most?  Which has the least?  How many in all?  How many people were surveyed?  How many more \_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_?  How many fewer \_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_?  Do any of the categories have the same amount?  How many \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_?  **E-Learning Modification:** Students can survey family members and then share and critique their finding through district approved platforms. |
| **Equitable Access** | You can make a graph out of just about anything (favorite ice cream, favorite color, favorite fruit, etc.) It is important to start with something physical you can graph together, then move into pictorial and bar graph representations of the data.  **Early Entry Point:** Student can compare two categories using picture and object graphs to notice how titles, labels and scale communicate results.  **Foundational Entry Point:** Students can generate questions, collect, organize and analyze data using object graphs, picture graphs, t-charts and tallies. |
| **Mathematical Vocabulary** | data  tally chart  tally mark  graph  organize  most  least  more  less  equal  compare  in all |
| **Student Reflection** | How can you use a graph to help you answer questions about data?  Which has the most?  Which has the least?  How many in all?  How many people were surveyed?  How many more \_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_?  How many fewer \_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_?  Do any of the categories have the same amount?  How many \_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_? |

Return to [Table of Contents](#Grade_One_Table_of_Content)



Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**1st grade  **Unit:**  Comparisons and Data | **Task Title:** Comparing Problems  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.ATO.1 Solve real-world/story problems using addition (as a joining action and as a part-part-whole action) and subtraction (as a separation action, finding parts of the whole, and as a comparison) through 20 with unknowns in all positions. |
| **Mathematical Process Standards Addressed** | 2a. Make sense of quantities and their relationships in mathematical and real-world situations. 2c. Translate among multiple mathematical representations and compare the meanings each representation conveys about the situation. 4a. Identify relevant quantities and develop a model to describe their relationships. |
| **Materials and Resources** | Two different types of manipulatives  Bag to hold manipulatives |
| **Task Description** | ***This task will introduce comparison problems that can be incorporated into math talks. Comparison problems can be introduced whole group and then worked on in small group with peers and teacher guidance. Students will eventually move to independently creating their own problems.***  Examples of whole group math talk comparison problems to demonstrate:  -We have 9 candies and 14 kids. Is there is enough for everyone to get a piece?  Model with real students and candies first to determine if there are enough, how many are extra or how many more are needed?  Ask student how they can use math equations to match the model.  -If I have 8 slices of pizza and 9 students, do I have enough pizza for everyone? Model with a drawing of students and pizza to determine if there are more students or more slices of pizza? Are there any extra slices of pizza or do I need to buy more pizza for everyone to have one?  Write equation to match the model. Discuss each part of the equation and how it matches the situation.  - Teacher can change problems and revisit this many times both whole group and small group. Model with real students/manipulatives first, then show how to draw a mathematical model.  **Extension/Practice:** Students can practice making comparisons with manipulatives.  Each student will have a bag of 2 different manipulatives. Students will reach into the bag and grab a large handful of manipulatives, sort into like groups, line up partners one to one, compare amounts of each, and discuss. Which one has more? How many more? Which one has less? How many more? How many less? What is different or the same about how many more and how many less?  ***Write a math equation to match model.***  Teacher will demonstrate task first, then students will complete during small group instruction with the teacher. Teacher needs to watch for correct one to one matching and lining up of tiles.  **The discussion of the comparisons and having students explain their thinking is the most important aspect of this activity.**  **E-Learning Modification:** Items from home can be used to compare and explanations can be shared through a district approved platform. Parents can be sent examples of homelife where comparing numbers could be practice. For example: “How many cookies do we need to bake so everyone can have one (or two or more)? Do we have enough place settings on the table? |
| **Equitable Access** | Change numbers of items, number in the group, amount each will receive, change the situation to make it interesting for your class (maybe birthday hats for a birthday party, or balls for a dribbling class, etc.)  May use any kind of manipulative or item they can use to compare 2 distinct groups.  **Early Entry Point:** Student can make comparisons between 2 groups of objects within 10 flexibly.  **Foundational Entry Point:** Students can make comparisons and justify how equations are structured to explain the real-world situation using mathematical language. |
| **Mathematical Vocabulary** | unit  sort  organize  compare  alike  different  most  least |
| **Student Reflection** | Why/When would it be helpful to know how many more or how many less? |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:**  **Comparisons and Data** | **Task Title:** Growing Patterns  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
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| **State Standards Addressed** | 1.ATO.9 Create, extend and explain using pictures and words for: b. growing patterns (between 2 and 4 terms/figures). |
| **Mathematical Process Standards Addressed** | 1a. Relate a problem to prior knowledge. 1c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. 2a. Make sense of quantities and their relationships in mathematical and real-world situations. |
| **Materials and Resources** | Blank paper to record |
| **Task Description** | Use the following concrete model to show how patterns can grow.  Have 2 students come to the front of the room. Discuss how each student has 2 shoes, so there are 4 shoes in all.  If another student comes up, how many shoes will there be? Have another student come up and show there are now 6 shoes.  Discuss/model how each time 1 student comes up, there will be 2 more shoes.  Represent and record pattern with pictures and numbers.  Extension: Can we figure out how many shoes there will be if there are 5 students? The teacher could also introduce repeated addition.  Student task:  Choose a dog, bird, or insect and record the growing pattern to show how the number of legs will increase each time another joins the group.  Have students represent with both pictures and numbers. |
| **Equitable Access** | Choose various examples such as, eyes per kid, socks per student, if students had 3 pencils each, etc. Early Entry Point: Students can identify AB patterns and extend it.  Foundational Entry Point: Students can create, extend and explain a variety of patterns found in their environments and mathematical situations. |
| **Mathematical Vocabulary** | unit before after order organize data |
| **Student Reflection** | How can understanding growing patterns help us? |

Return to [Table of Contents](#Grade_One_Table_of_Content)

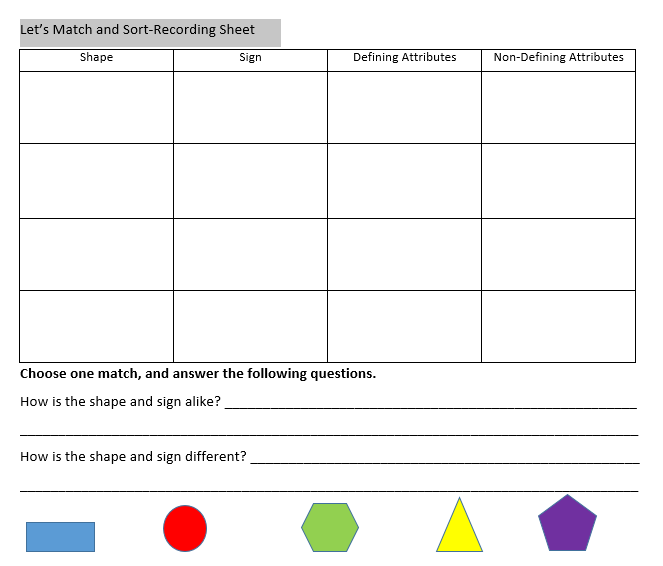
| **1st Grade Math Unit 6**  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
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| **Geometry and Equal Shares** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.G.1**  Distinguish between a two-dimensional shape’s defining (e.g., number of sides) and non-defining attributes (e.g., color).   + Two-Dimensional Shapes - Defining Attributes for 1st grade: * Closed figure, straight sides/edges, number of sides/edges, number of corners/vertices, and relationship between length of edges (all equal edges; all unequal edges; some equal and some unequal edges)   + Circle - Defining Attributes for 1st grade:     - No corner/vertex (vertices)   + ***Teacher Note:*** *Students should use attributes such as equal sides, side lengths, angles, number of faces, and shapes of faces. Identify closed and non-closed (open)shapes. Non-defining attributes might include color, size, thickness, and orientation. Know that a corner is where two sides meet in a two-dimensional figure. Students should use attribute blocks. Students should continue to draw and build shapes to possess defining attributes* * **1.G.2**  Combine two-dimensional shapes (i.e., square, rectangle, triangle, hexagon, rhombus, and trapezoid) or three-dimensional shapes   (i.e., cube, rectangular prism, cone, and cylinder) in more than one way to form a composite shape.   * + This means to put together 2-D shapes to form different 2-D shapes or put together 3-D shapes to form different 3-D shapes without naming the new shape but simply focusing on what shapes were combined, what were the defining attributes of the original compared to the defining attributes of the new shape - the defining attributes listed under 1.G.1 above.   + A “composite shape” is a shape made up of several different shapes.   + A rectangular prism is a solid with two identical rectangular bases. * **1.G.3**  Partition two-dimensional shapes (i.e., square, rectangle, circle) into two or four equal parts.   + This is the beginning development of the concept of fractions. The concepts of halves or fourths do not appear in any other strands in this grade level. So this standard deserves special attention since it is the first exposure to fractions. The emphasis here is on the idea of equal shares/parts. The formal idea and symbolism of fractions are introduced in grade 3. * **1.G.4**  Identify and name two-dimensional shapes (i.e., square, rectangle, triangle, hexagon, rhombus, trapezoid, and circle).   + rhombus: A rhombus at this point is a shape with 4 sides and all sides the same length. Use the blue pattern block or diamond shape as an example , not the square.   + rectangle: a closed shape with four sides and four square corners   + square: a rectangle that has four equal sides   + trapezoid: a four-sided closed shape with only two opposite sides that are parallel. (Rectangles have 4 square corners and trapezoids do not) A trapezoid at this point is a shape with 4 sides and not all of them are the same length (the red one). * **1.ATO.9**  Create, extend and explain using pictures and words for:   1. repeating patterns (e.g., AB, AAB, ABB, and ABC type patterns);   2. growing patterns (between 2 and 4 terms/figures).   + Students do not need to use the letters. Students just need to create, extend, and explain something like red, blue, (AB), red, red, blue (AAB), or red, blue green (ABC)- Or the patterns could be pictures such as shapes. |
| **New Academic Vocabulary for This Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * defining attributes * prism | * non-defining attributes * hexagon | * rhombus | * trapezoid | * rectangular prism | |
| **Prior Knowledge Required for This Unit** |
| In Kindergarten, the main focus was on identifying 2-D versus 3-D shapes. Students analyzed and compared two- and three dimensional shapes of different sizes and orientation using informal language.  Kindergarten students developed an understanding of repeating patterns. Kindergarteners *described* simple repeating patterns using AB, AAB, ABB, and ABC type patterns. Unit 6 extends understanding of a repeating pattern as well as introduces growing patterns. Students will *create,**extend,*and*explain*using pictures and words for repeating patterns and growing patterns. **(1.ATO.9)** |
| **Subsequent Knowledge Related to This Unit** |
| Students combining two-dimensional shapes (i.e., square, rectangle, triangle, hexagon, rhombus, and trapezoid) or three-dimensional shapes (i.e., cube, rectangular prism, cone, and cylinder) in more than one way to form a composite shape***(*1.G.2)** sets foundation for later development of conservation ideas and spatial reasoning.  In second grade, students will partition squares, rectangles, and circles into two or four equal parts and describe the parts using the words *halves*, *fourths*, *a half of*, and *a fourth of*. They will develop an understanding that when partitioning these shapes, the parts become smaller as the number of parts increases. **(2.G.3)**  In third grade, students will identify a rule for an arithmetic pattern (e.g., patterns in the addition table or multiplication table). **(3.ATO.9)**. In fourth grade, students will generate a number or shape pattern that follows a given rule and determine a term that appeals later in the sequence.**(4.ATO.5)** |
| **Relationship Among Standards in This Unit** |
| Unit 6 focuses on reasoning about attributes of, and composing and decomposing geometric shapes. In Unit 6 students will identify, name, distinguish between defining and non-defining attributes, combine, and partition geometric shapes. |
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| Students in 1st grade are working with some of the same shapes as in Kindergarten (triangle, square, rectangle, hexagon, circle, cone, cube, cylinder and sphere). However, they are adding the rhombus and trapezoid. The Kindergarten shapes are repeated and additional shapes added because the emphasis in first grade is on distinguishing between defining and non-defining attributes. To help students focus on defining versus non-defining attributes, students should be given the opportunity to partition 2-D shapes into two or four equal parts and to combine 2-D and 3-D shapes to form a composite shape. Again, the goal for partitioning and combining is to encourage students to focus on the shapes’ attributes. When composing shapes, the sides of all the shapes should align. Composing shapes helps students form visual images of all kinds of shapes they can create with defining attributes. In addition, it is important that students recognize the equality of parts when partitioning shapes  **Teacher Note:** Describe the whole as two or four of the parts. Understand for these examples that decomposing into more equal parts creates smaller parts. This is the beginning development of fractions. The emphasis should be on equal shares. **1.G.3**  **Attributes of Shapes (1.G.1, 1.G.2, 1.G.4)**  [**Grade 1 Mathematics Module 5, Topic A; lessons 1-3**](https://www.engageny.org/resource/grade-1-mathematics-module-5-topic)   * *In Module 5 students build on their exploration and knowledge of shapes from kindergarten. In Topic A, students identify the defining attributes of individual shapes.*    + Objective 1: Classify shapes based on defining attributes using examples, variants, and non-examples. (lesson 1).   + Objective 2: Find and name two-dimensional shapes including trapezoid, rhombus, and a square as a special rectangle, based on defining attributes of sides and corners. (lesson 2)   + Objective 3: Find and name three-dimensional shapes including cone and rectangular prism, based on defining attributes of faces and points. (lesson 3)   [***Student, Student, What Do You See?***](http://betterlesson.com/lesson/522131/student-student-what-do-you-see)  http://betterlesson.com/lesson/522131/student-student-what-do-you-see   * Possible introductory lesson for a geometry unit. The teacher and students participate in a ‘Shape Talk’ discussion prior to beginning a unit on shapes.   [**Part-Whole Relationships Within Composite Shapes**](https://www.engageny.org/resource/grade-1-mathematics-module-5-topic-b)(1.G.1, 1.G.2, 1.G.4)  https://www.engageny.org/resource/grade-1-mathematics-module-5-topic-b   * **Grade 1 Module 5, Topic B: lessons 4 and 6** * In Topic B, students combine shapes to form composite shapes, which in turn get larger as they add yet more shapes. As students work toward the objectives within the topic, they informally explore relationships between parts and wholes.   [**Unit 6: Understanding Shapes and Fractions**](https://www.georgiastandards.org/Georgia-Standards/Frameworks/1st-Math-Unit-6.pdf) (1.G.1, 1.G.2, 1.G.3, 1.G.4)   * Refer to Tasks 1-7   [***More Than One Way*:**](http://betterlesson.com/lesson/543673/more-ways-than-one)  http://betterlesson.com/lesson/543673/more-ways-than-one   * In this lesson, students use concrete manipulatives to practice forming composite shapes (1.G.2).   **Peppermint Parts:** 1.G.3   * The below lesson will need to be modified. Students do not need to partition shapes into three equal parts. * <http://www.lakeshorelearning.com/media/images/free_resources/teachers_corner/lesson_plans/1_2/lessonPeppermintPartsFractionFull.pdf?ASSORTMENT%3C%3East_id=1408474395181113&bmUID=1456023160505>   **Activity: Math Read Aloud Task: 1.G.1, 1.G.2, 1.G.4**   * Materials: copy of Mouse Shapes by Ellen Stoll Walsh, pattern blocks or precut shapes * Math Read aloud task card: [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/)   **Activity: Putting Shapes together:** [www.k-5mathteachingresources.com](https://www.k-5mathteachingresources.com/)   * Students will combine pattern blocks in more than one way to form a composite shape. Students will write about the new shape they composed.   **Interactive Activity:** [**Patch Tool**](http://illuminations.nctm.org/Activity.aspx?id=3577)**:** **1.ATO.9**  http://illuminations.nctm.org/Activity.aspx?id=3577   * Quilters and other designers sometimes start by producing square patches with a pattern on them. These square patches are then repeated and connected to produce a larger pattern. Create your own patch using the shapes in the tool below.  [Investigating Growing Patterns](http://www.mathwire.com/algebra/growingpatterns.html): http://www.mathwire.com/algebra/growingpatterns.html   * **Lessons and Activities:**  http://www.kindergartenkindergarten.com/patterns/   + [Five activities](http://www.mathwire.com/algebra/growingpatterns.html) * [**Stair-Step Pattern for Growing patterns**](http://www.eduplace.com/math/mthexp/g1/mathbkg/pdf/mb_g1_u1.pdf)**.**   + http://www.eduplace.com/math/mthexp/g1/visual/pdf/vs\_g1\_17.pdf   [**Grade 1 Module 5 , Topic C: Lesson 7**](https://www.engageny.org/resource/grade-1-mathematics-module-5-topic-c-lesson-7)  **https://www.engageny.org/resource/grade-1-mathematics-module-5-topic-c-lesson-7**   * Students will name and count shapes as part of a whole, recognizing relative sizes of the parts. |
| **Instructional Resources** |
| * [Linking the van Hiele Theory to Instruction](http://www.nctm.org/Publications/teaching-children-mathematics/2014/Vol21/Issue5/Linking-the-Van-Hiele-Theory-to-Instruction) by Tashana D. Howse and Mark E. Howse, NCTM Teaching Children Mathematics December 2014   + This article describes the van Hiele progression of spatial sense and reasoning and links it to classroom instruction. * **Kindergarten Unit 7**: *Two Dimensional and Three Dimensional Geometry* * **Stair-Step Pattern for Growing patterns.**   + http://www.eduplace.com/math/mthexp/g1/mathbkg/pdf/mb\_g1\_u1.pdf   + http://www.eduplace.com/math/mthexp/g1/visual/pdf/vs\_g1\_17.pdf  [Investigating Growing Patterns](http://www.mathwire.com/algebra/growingpatterns.html): http://www.mathwire.com/algebra/growingpatterns.html  * [**Lessons and Activities:**](http://www.kindergartenkindergarten.com/patterns/)  http://www.kindergartenkindergarten.com/patterns/ * **Interactive Modeling Tool:** [Pattern Blocks:](http://www.mathplayground.com/patternblocks.html) http://www.mathplayground.com/patternblocks.html   + Build patterns, create and solve critical thinking problems, and explore geometric shapes. * **Interactive Modeling Tool:** [Geoboard:](http://www.mathlearningcenter.org/web-apps/geoboard/) http://www.mathlearningcenter.org/web-apps/geoboard/   + “Geoboard is a tool for exploring a variety of mathematical topics introduced in the elementary and middle grades. Learners stretch bands around the pegs to form line segments and polygons and make discoveries about perimeter, area, angles, congruence, fractions, and more.”   Resources for Interactive Sites:   * **Virtual Manipulative:** [**Math Spinner:**](http://www.senteacher.org/worksheet/13/Fractions.html)http://www.senteacher.org/worksheet/13/Fractions.html * This is a website where you can make exactly what you need. * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters) * **Virtual Manipulative:** [Number Blocks Freeplay:](http://www.mathsisfun.com/numbers/number-block-freeplay.html)   http://www.mathsisfun.com/numbers/number-block-freeplay.html   * Make nice patterns: pyramids, squares, rectangles ... even shapes like cats. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:** 1st **Unit:**  Geometry and Equal Shares | **Task Title:** Let’s Match and Sort Shapes!  Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.G.1 Distinguish between a two-dimensional shape’s defining (e.g., number of sides) and non-defining attributes (e.g., color).  1.G.4 Identify and name two-dimensional shapes (i.e., square, rectangle, triangle, hexagon, rhombus, trapezoid, and circle). |
| **Mathematical Process Standards Addressed** | 1c. Analyze what is given, what is not given, what is being  asked, and what strategies are needed, and make an initial  attempt to solve a problem.  4d. Evaluate the reasonableness of a model and refine it if  necessary.  6c. Use appropriate and precise mathematical language. |
| **Materials and Resources** | * Attribute blocks (enough for each student to have their own set) * Cardstock or laminated signs (1 color copy for each student) * Recording sheet (see below) * Pencil |
| **Task Description** | ***The purpose of this task is to analyze defining and non-defining attributes of two-dimensional shapes. This is designed to be check for understanding after some experiences exploring geometric attributes.*** Students will use attribute language to describe two-dimensional shapes: number of sides, number of vertices/points, straight sides, closed.   1. The students will match attribute blocks to the corresponding signs.The students will be able to touch the sides and corners of each sign and shape. 2. The students will record the defining and non-defining attributes on a recording sheet. 3. The students will tell how each shape and sign are alikeand how they are different. 4. After matching and comparing the shapes, the students will sort the shapes and signs by number of sides.   **Student Support:** Students may need vocabulary for shapes and attributes displayed on an anchor chart to help with spelling and recall. For students who have a difficult time writing, they could take a picture of the signs and record themselves talking about the shapes and describing the defining and non-defining attributes.  **E-Learning Modification:** This task can be extended by having students go on a scavenger hunt for shaped signs around the room, school, or on their way home. |
| **Equitable Access** | Students may need vocabulary for shapes and attributes displayed on an anchor chart or slides to help with spelling and recall. The shapes can be labeled on the recording sheet for students who need more support. For students who have a difficult time writing, they could take a picture of the signs and record themselves talking about the shapes and describing the defining and non-defining attributes.  Early Entry Point: Student can identify geometric attributes of two-dimensional shapes like sides and distinguish them from three-dimensional figures.  Foundational Entry Point: Students can identify two-dimensional shapes by name and explain some defining attributes. |
| **Mathematical Vocabulary** | defining attributes  non-defining attributes  vertex  vertices  sides  square  rectangle  circle  triangle  rhombus  trapezoid  hexagon  open shape  closed shape |
| **Student Reflection** | The student should be able to express ideas such as, “A square is a square because it has four straight and equal sides, four corners, and is closed.” |

Return to [Table of Contents](#Table_of_Contents)

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| Image result for sign clipart | Image result for exit signs shapes clipart |
| Image result for school sign | Image result for school sign |



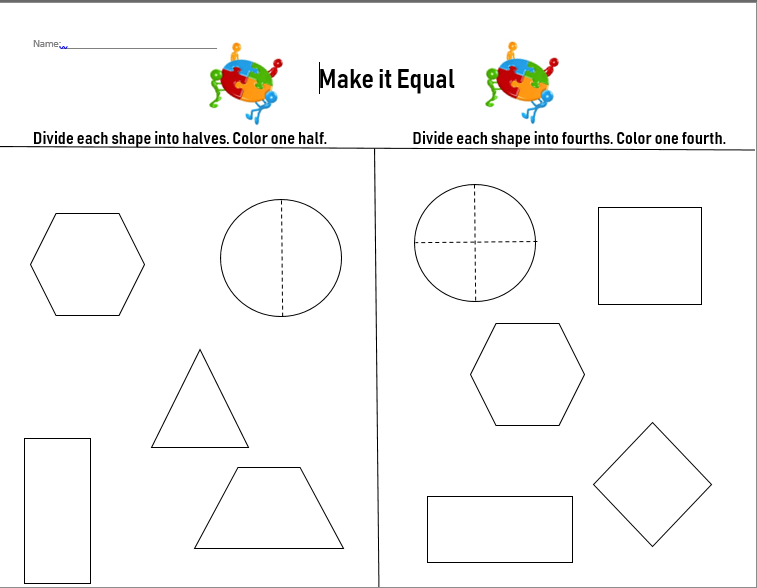
Return to [Table of Contents](#Grade_One_Table_of_Content)

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| **Course/Grade:** 1st **Unit:**  Geometry and Equal Shares | **Task Title:** Filling Shapes with More or Less  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| **State Standards Addressed** | 1.G.2 Combine two-dimensional shapes (i.e./ square, rectangle, triangle, hexagon, rhombus, and trapezoid) or three-dimensional shapes (i.e., cube, rectangular prism, cone, and cylinder) in more than one way to form a composite shape. |
| **Mathematical Process Standards Addressed** | 1b. Recognize there may be multiple entry points to a problem and more than one path to a solution.  5a. Select and use appropriate tools when solving a mathematical problem.  6c. Use appropriate and precise mathematical language. |
| **Materials and Resources** | * Pattern/Attribute blocks * Digital attribute blocks <https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Shape-Tool/> * The Doorbell Rang by Pat Hutchins |
| **Task Description** | 1. Students will demonstrate how shapes can be used to make a composite shape (house). The teacher can then demonstrate how to make the same composite shape using different shapes (two triangles to form the square). 2. Students will work in pairs to create their own composite shape. The teacher will give each pair of students a set of varied shapes. 3. Partner A will build a composite shape. 4. Partner B will recreate the composite shape using different shapes. ***The teacher can have a basket of misc. shapes for students to use if they run out of shapes in their own set.*** 5. Partners will then discuss and explain how the two shapes are alike and different. 6. When all shapes have been built, students will go on a gallery walk to observe how shapes can be combined in different ways to create the same shape.   **E-Learning Modification:** Students can use digital shapes to create composite shapes and then upload designs through a district approved platform. <https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Shape-Tool/> |
| **Equitable Access** | Students are able to make their shapes as simple or as complicated as they want.  **Early Entry Point:** Student can explore creating composite shapes.  **Foundational Entry Point:** Students can combine two-dimensional and three-dimensional shapes in multiple ways and form a composite shape. |
| **Mathematical Vocabulary** | | * compose * decompose * square * circle * triangle | * hexagon * trapezoid * rectangle * rhombus * composite shape | | --- | --- | |
| **Student Reflection** | Students will compare to explain how both shapes are the same and different. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:** 1st **Unit:**  Geometry and Equal Shares | **Task Title:** Be Fair and Share  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.G.3 Partition two-dimensional shapes (i.e. square, rectangle, circle) into two or four equal parts. |
| **Mathematical Process Standards Addressed** | 1b. Recognize there may be multiple entry points to a problem and more than one path to a solution.  5a. Select and use appropriate tools when solving a mathematical problem.  6c. Use appropriate and precise mathematical language. |
| **Materials and Resources** | * 3 Giant Cookies (butcher paper circles) * Brown construction paper with three cookies drawn on it (1 per student) * White paper (1 sheet for each student) * Glue sticks * Scissors * Make it Equal printable for small group. |
| **Task Description** | 1. The teacher can ask “How many of you like cookies? Well today I have a big cookie, and one lucky person is going to be really happy because they get to have this WHOLE delicious cookie! Who can eat one WHOLE cookie?” 2. “I have another cookie but this time I want to share it with two friends. What should I do? Can you help me make it fair for both friends? Is this a fair way to divide my cookie? We call this HALF. We have two HALVES. Each friend gets one HALF of the cookie.” 3. “Guess what?! I have another cookie! This time I have four friends. What are we going to do? ...Repeat the activity using suggestions from the students on how to make it fair/equal. 4. The teacher will give each student a piece of brown construction paper with three chocolate chip cookies printed on it and a piece of white paper. The students will cut out the cookies. 5. The student will glue the whole cookie on the white paper and label it whole. 6. The student will then divide the second cookie into two equal pieces and glue the two pieces on the white paper and label it halves ½. 7. Finally, the student will divide the third cookie into four equal pieces and glue them to the white paper and label it fourths ¼.   **Extensions:** The students can cut out and divide other shapes such as squares and rectangles. They can also complete the attached printable to see how other shapes can be evenly divided. The teacher can read The Doorbell Rang by Pat Hutchins and have students predict how many cookies each child will get. <https://www.youtube.com/watch?v=ESHLF92_rBw>  **E-Learning:** Students can divide real food such as cookies, cakes, pies, pizza, brownies. |
| **Equitable Access** | Use different shapes to show equal parts. (square, rectangle, rhombus, etc)  **Early Entry Point:** Student can use various symmetrical two-dimensional shapes that can demonstrate halves by folding, then drawing a line to label each part that makes the whole.  **Foundational Entry Point:** Students can draw lines to show halves and quarters using a variety of two-dimensional shapes. |
| **Mathematical Vocabulary** | Whole  half  fourth  equal |
| **Student Reflection** | Students can explain how their cookies are divided fairly. Students can write about a time that they needed to divide something equally. |

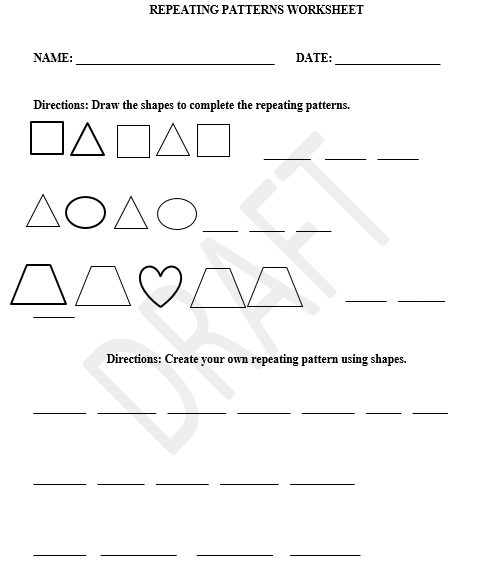
Return to [Table of Contents](#Grade_One_Table_of_Content)



Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:** 1st **Unit:**  Geometry and Equal Shares | **Task Title:** Repeating Patterns  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
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| **State Standards Addressed** | 1.ATO.9 Create, extend and explain using pictures and words for:  a. repeating patterns (e.g., AB, AAB, ABB, and ABC type patterns) |
| **Mathematical Process Standards Addressed** | 1b. Recognize there may be multiple entry points to a problem and more than one path to a solution.  5a. Select and use appropriate tools when solving a mathematical problem.  6c. Use appropriate and precise mathematical language. |
| **Materials and Resources** | * Manipulatives for students to make patterns * Repeating Patterns Worksheet * <https://jr.brainpop.com/math/geometry/patterns/> |
| **Task Description** | 1. Display a repeating pattern (example: red square, blue circle, red square, blue circle, etc.). Then, ask students to tell you what they think comes next in the row of shapes. Have a couple students explain their thinking to the class and then tell them that the concept of repeating patterns is what you will be exploring today. 2. The students will watch a Brainpop jr video on repeating patterns <https://jr.brainpop.com/math/geometry/patterns/> 3. The teacher will then use students to create patterns. Allow students to discuss what type of patterns they would like to make with the group of students. 4. The teacher will then divide the class into 2 groups and have each group form a pattern with group members. The other group will then have to describe the pattern. 5. Students will then be given a group of manipulatives (counting bears, counters, Legos, linking cubes, etc.) and will make a pattern independently. Once completed the students will pair up to see if they can identify the pattern and extend it.   **Extension:**  Students can bring in examples of patterns found at home and in the neighborhood and see if classmates can identify the pattern.  Hand out the worksheet on repeating patterns. Explain to them that they will be completing the repeating patterns on the page and then drawing their own repeating pattern at the bottom.  If time remains, have students share one of their favorite patterns with the class.  **E-Learning:** The Brainpop Jr video <https://jr.brainpop.com/math/geometry/patterns/> can be shared with students and then they can look for repeating patterns around their homes. Students can upload found patterns from home/neighborhood on district approved platform and explain the pattern. |
| **Equitable Access** | Students get to create their own patterns. The patterns can be as basic or advanced as the student wants to make them.  Early Entry Point: Students can identify and extend AB patterns.  Foundational Entry Point: Student can create, extend and explain using pictures, in writing or in discourse, a variety of pattern structures. |
| **Mathematical Vocabulary** | * pattern * repeating pattern |
| **Student Reflection** | Students will share the repeating patterns they created with their group members. |

Return to [Table of Contents](#Grade_One_Table_of_Content)



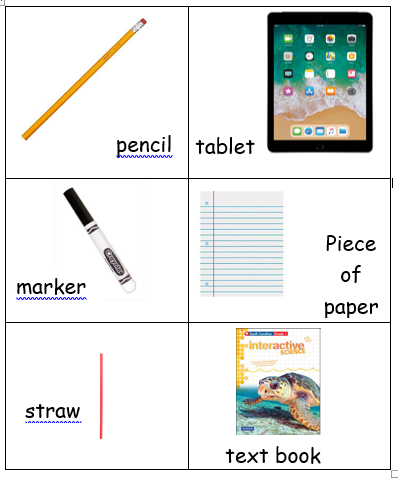
Return to [Table of Contents](#Grade_One_Table_of_Content)

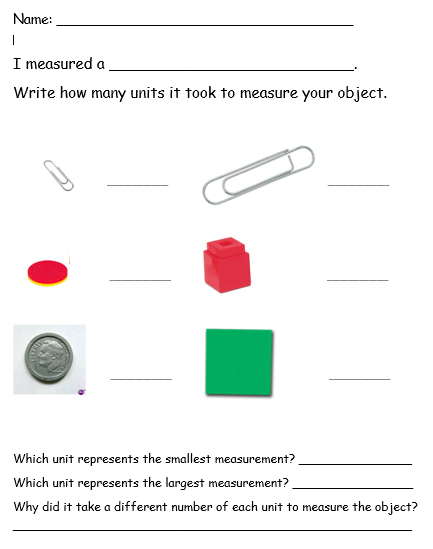
| **1st Grade Math Unit 7** Return to [Table of Contents](#Grade_One_Table_of_Content) [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- |
| **Measurement, Time and Money** |
| **Content Standards with Clarifying Notes**  *Open Bullets Indicate Clarifying Notes* |
| * **1.MDA.1**  Order three objects by length using indirect comparison.   + Compare the lengths of two objects indirectly by using a third object. * **1.MDA.2**  Use nonstandard physical models to show the length of an object as the number of same size units of length with no gaps or overlaps.   + Teachers should ensure that students have units laid end-to-end with no gaps or overlaps and reach from one end of the object to be measured to the other end. * **1.MDA.3**  Use analog and digital clocks to tell and record time to the hour and half hour.   + Students should be using terms morning, night, today, tomorrow, yesterday, now later, a.m, p.m.   + Teachers should not expect students to draw clocks. Having first grade students draw clocks is developmentally inappropriate. * **1.MDA.6**  Identify a penny, nickel, dime and quarter and write the coin values using a ¢ symbol   + This aligns with first grade counting by ones, fives, and tens and working with one and two digit numbers. |
| **New Academic Vocabulary for This Unit** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | * length * measure * nickel | * gap, overlap * analog clock * dime | * digital clock * hour * quarter | * half hour * before, after * cents | * measurable attribute * penny | |
| **Prior Knowledge Required for This Unit** |
| In kindergarten, students explored measurable attributes and developed measurement sense to help solidify what the measurement process truly is and how it works. Students must remember that the measurement includes both the number and the same size units. Now students are using nonstandard physical models to produce a number called a *measure*.  Students should be able to explore length comparisons both directly and indirectly. In kindergarten, students made direct comparisons. Unit 7 will build and expand upon the direct comparison, extending their prior knowledge to make comparisons through the use of a third object. |
| **Subsequent Knowledge Related to This Unit** |
| In first grade students will begin to estimate lengths and explore why the same unit must be applied when measuring an object using nonstandard units. Students will begin measuring using standard units in second grade. In grades 2-5 students will interact with measuring in both customary and metric units.  Students will be introduced to dollar bills and their value in second grade. In second grade students will build on their understanding of telling and recording time to the nearest hour and half hour. In second grade, the time intervals are identified as five minute intervals, and they will add A.M. and P.M. when recording time. |
| **Relationship Among Standards in This Unit** |
| *Unit 7* will focus on students developing an understanding of linear measurement and measuring lengths as iterating length units. Students will develop an understanding of the meaning and processes of measurement. Students will work with both analog and digital clocks as they tell and record time to the nearest hour and half hour. Students will identify coins and their values. |
|  |
| **1.MDA.2** Use nonstandard physical models to show the length of an object as the number of same size units of length with no gaps or overlaps.  “It is useful to measure the same object with different sized units. Results should be predicted in advance and discussed afterward. This will help students understand that the unit used is as important as the attribute being measured. The fact that smaller units produce larger numeric measures, and vice versa, is hard for young children to understand. This inverse relationship can only be constructed by reflecting on measurements with varying-sized units. Predictions and discussions of results add to the reflective nature of activities.” *(Teaching Student-Centered Mathematics Grades K-3 John Van de Walle, 2006)*  **Indirect Comparison in Length Measurement**  [**Grade 1 Module 3, Topic A: Lessons 1-3; 1.MDA.1**](https://www.engageny.org/resource/grade-1-mathematics-module-3)  https://www.engageny.org/resource/grade-1-mathematics-module-3   * *Module 3 extends students’ Kindergarten experiences with direct length comparison to the new learning of indirect comparison whereby the length of one object is used to compare the lengths of two other objects*    + Lesson 1: Compare length directly and consider the importance of aligning endpoints.   + Lesson 2: Compare length using indirect comparison by finding objects *longer than*, *shorter than,* and *equal in length to* that of a string. Lesson 3: Order three lengths using indirect comparison.   [**Grade 1 Module 3, Topic B:** Standard Length Units; **Lessons 4-6; 1.MDA.1, 1.MDA.2**](https://www.engageny.org/resource/grade-1-mathematics-module-3-topic-b)   * *“In Topic B, students are introduced to the idea of a length unit. The objects being measured by students include many of the same objects measured in Topic A so that students can add greater precision to their measurements as they specify the number of units equal to the length of the objects being compared”*    + Lesson 4: Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps.   + Lesson 5: Rename and measure with centimeter cubes, using their standard unit name of centimeters.   + Lesson 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems*.*   **Grade 1 Module 3, Topic C:** Non-Standard and Standard Length Units**: Lessons 7-9; 1.ATO.1, 1.MDA.2**   * *“Topic C gives students a chance to explore the usefulness of measuring with similar units. The topic opens with Lesson 7, where students measure the same objects from Topic B using two different non-standard length units simultaneously, such as toothpicks and small paper clips.”*   + Lesson 7: Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit.   + Lesson 8: Understand the need to use the same units when comparing measurements with others.   + Lesson 9: Answer *compare with difference unknown* problems about lengths of two different objects measured in centimeters.   [**Grade 1 Module 5, Topic D:** Application of Halves to Tell Time;](https://www.engageny.org/resource/grade-1-mathematics-module-5-topic-d) **Lessons 10-13; 1.MDA.3**   * *Topic D builds on students’ knowledge of parts of circles to tell time.*    + Lesson 10: Construct a paper clock by partitioning a circle and tell time to the hour.   + Lessons 11-13: Recognize halves within a circular clock face and tell time to the half hour.   [**Grade 1 Module 6, Topic E:** Coins and Their Values;](https://www.engageny.org/resource/grade-1-mathematics-module-6-topic-e) **Lessons 20-24; 1.MDA.6**   * *“Through Topic E, students learn about the four most predominant U.S. coins in circulation, the penny, the nickel, the dime, and the quarter. Students identify and use the coins based on their image, name, and/or value.”*   + Lesson 2O: Identify pennies, nickels, and dimes by their image, name, or value. Decompose the values of nickels and dimes using pennies and nickels.   + Lesson 21: Identify quarters by their image, name, or value. Decompose the value of a quarter using pennies, nickels, and dimes.   + Lesson 22: Identify varied coins by their image, name, or value. Add one cent to the value of any coin.   + Lesson 23: Count on using pennies from any single coin.   + Lesson 24: Use dimes and pennies as representations of numbers to 120. |
| **Instructional Resources** |
| * **Interactive Modeling Tool:** [Geoboard:](http://www.mathlearningcenter.org/web-apps/geoboard/)   http://www.mathlearningcenter.org/web-apps/geoboard/   * [**Time to Move:**](http://www.pbs.org/parents/education/math/games/first-second-grade/time-to-move/)   http://www.pbs.org/parents/education/math/games/first-second-grade/time-to-move/   * + This is a measurement game. * **Virtual Manipulatives:**<http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html>   + This resource can be used a variety of ways. Options to select: Grade, Backgrounds (i.e.,Game Boards, Story Boards, Workmats), and Manipulatives (e.g., attribute blocks, attribute buttons, color tiles, connecting cubes, spinner, two-color counters)  Investigating Growing Patterns: http://www.mathwire.com/algebra/growingpatterns.html [Five activities](http://www.kindergartenkindergarten.com/patterns/)   * [**Stair-Step Pattern for Growing patterns.**](http://www.eduplace.com/math/mthexp/g1/visual/pdf/vs_g1_17.pdf)   + http://www.eduplace.com/math/mthexp/g1/mathbkg/pdf/mb\_g1\_u1.pdf * **Interactive Activity:** [**Patch Tool:**](http://illuminations.nctm.org/Activity.aspx?id=3577)  **1.ATO.9**   http://illuminations.nctm.org/Activity.aspx?id=3577   * + Quilters and other designers sometimes start by producing square patches with a pattern on them. These square patches are then repeated and connected to produce a larger pattern. Create your own patch using the shapes in the tool below. |

Return to [Table of Contents](#Table_of_Contents)

| **Course/Grade:**1st grade  **Unit:**  Measurement, Time and Money | **Task Title:** Measuring with Nonstandard Units  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1. MDA.1 Order three objects by length using indirect comparison.  1. MDA.2 Use nonstandard physical models to show the length of an object as the number of same size units of length with no gaps or overlaps. |
| **Mathematical Process Standards Addressed** | 7b. Recognize mathematical repetition in order to make generalizations. 6d. Use appropriate units, scales, and labels. 5b. Use technological tools and other external mathematical resources to explore and deepen understanding of concepts. |
| **Materials and Resources** | Each student will need a plastic bag of at least 30 of each of the following:  linking cubes  small paper clips  large paper clips  round counters  plastic dimes  foam squares  Each student will need a textbook, unsharpened pencil, tablet, marker, piece of paper, ***OR*** straw.  Each student will need a recording sheet (see attached) and the teacher will need enough item cards (see attached) for each student to be able to make a choice. |
| **Task Description** | **How do we measure length using objects?**  **How does the unit matter when we communicate what we measure?**  **How can we apply measuring length in our lives?**   1. Students will choose an item card and find the corresponding item. 2. The students will be given a bag containing various units of measurement (see materials list above). 3. The students will then use one unit of measurement from their bag to measure the object. Discuss the technique used to measure with precision (no gaps, overlapping and lined up) The number of units needed to measure the item will then be written on the recording sheet. 4. The student will repeat the activity using all the items used as units of measurement found in the plastic bag. 5. The teacher will be observing to ensure that students are only using one type of unit per measurement at a time and that there are no gaps or overlapping. 6. Once the student has used all units of measurement to measure the object, they will discuss their findings. They can do this by directly answering the questions on the recording sheet, taking a picture of the recording sheet and typing on the photo, or uploading the recording sheet to a district approved program and recording themselves discussing their findings. 7. Once this initial activity has been completed, students will be regrouped. Each group will be made up of three students with different objects. The students will use the information from their recording sheet to order their objects from shortest to longest based on measurements.   After they explore how to use objects to compare length, ask student to reflect using the following questions:  **How do we measure length using objects?**  **How does the unit matter when we communicate what we measure?**  **When can we apply measuring length in our lives?**  **E-Learning Modification:** Students can measure items found at home. They can take a picture of their measurements and talk about what they discovered on a district approved platform. |
| **Equitable Access** | Students will be allowed to pick the order in which they measure with a particular unit.  **Early Entry Point:** Students can compare objects by stating if an object is shorter/taller/longer etc.  **Foundational Entry Point:** Students can use nonstandard units to with precision to make comparisons about length. (Example: This pencil is one paperclip longer than the marker) |
| **Mathematical Vocabulary** | Length  Measure  Overlap  gap |
| **Student Reflection** | The students will be able to explore with a variety of different units in which to use for measuring. They will be given the opportunity to practice measuring without gaps or overlaps while starting at an end-point.  Students will be allowed to share their learning and observations either in written form or verbally. This activity will demonstrate to students that numerical measurement depends on the size of the unit. |

Return to [Table of Contents](#Grade_One_Table_of_Content)

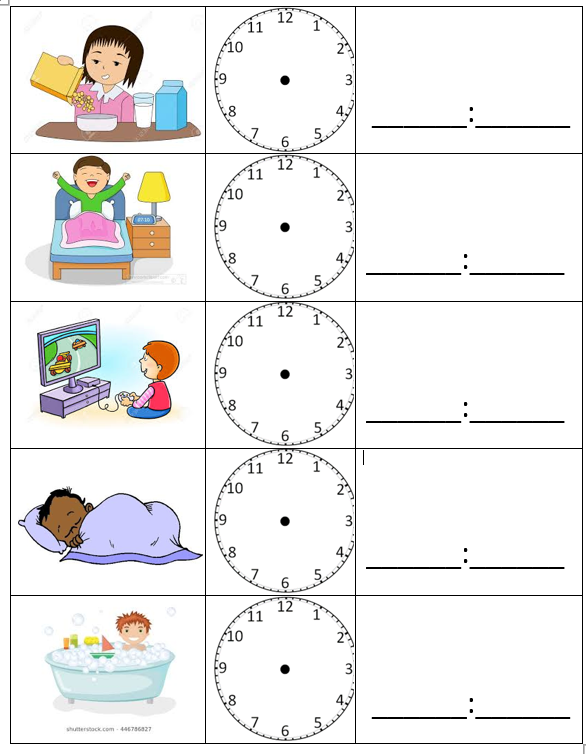




Return to [Table of Contents](#Grade_One_Table_of_Content)

| **Course/Grade:**  1st grade  **Unit:**  Measurement, Time and Money | **Task Title:** Telling and Recording Time to the Hour and Half Hour  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1. MDA.3 Use analog and digital clocks to tell and record time to the hour and half hour. |
| **Mathematical Process Standards Addressed** | 2b. Describe a given situation using multiple mathematical representations. 4b. Interpret mathematical models in the context of the situation. 3a. Construct and justify a solution to a problem. |
| **Materials and Resources** | Recording sheet (optional: laminate or put in sheet protector so the recording sheet can be used multiple times)  Expo marker  Analog clocks for each student  Song:  <https://numberock.com/lessons/telling-time-hour-half-hour/>  Paper Plate Clock: <https://www.pbs.org/parents/crafts-and-experiments/learning-to-tell-time-with-a-paper-plate-clock>  Digital Clock: <https://www.visnos.com/demos/clock> |
| **Task Description** | ***This lesson will be a culminating activity after students have practiced telling and recording time to the hour and half hour.*** ***This activity can be done in whole group or small group.***   1. The students will listen/sing [the song.](https://numberock.com/lessons/telling-time-hour-half-hour/) 2. The teacher will show times on analog and digital clocks and have students state the time. 3. The teacher will then show written times to the hour and half hour and have students record the time on their individual analog clocks. 4. The teacher will use observations from this activity to determine how to group students. 5. Students will then be paired as partners. (If the teacher noticed a student was having trouble telling/recording time, that student would be paired with a student that had mastered telling/recording time). 6. Each pair would be given a recording sheet of blank clock faces and pictures depicting activities students might complete during their day. 7. The students will record an appropriate time that the pictured activity might occur. 8. Each student would have their own recording sheet but would work with a partner to complete the task. 9. After the activity is completed, students will pair with a different partner to share the information that is recorded on their recording sheet.   **Extension:** Students ask other people about their schedules and record the times on the recording sheet.  **E-Learning Modifications:** Students can make a paper plate clockor use digital clockand complete assignment.  Paper Plate Clock:<https://www.pbs.org/parents/crafts-and-experiments/learning-to-tell-time-with-a-paper-plate-clock>  Digital Clock: <https://www.visnos.com/demos/clock> |
| **Equitable Access** | Students will record times that match their own personal daily schedule.  **Early Entry Point:** Students can identify the hour of their activities and match it with an analog and digital clock.  **Foundational Entry Point:** Students can identify the hour and half hour of their events using an analog and digital clock. |
| **Mathematical Vocabulary** | analog clock,  digital clock  hour  half hour before, after |
| **Student Reflection** | Students will have an opportunity to share the times that are recorded on their recording sheets to compare daily schedules with peers. |

Return to [Table of Contents](#Grade_One_Table_of_Content)



| **Course/Grade:**  **1st Grade Unit:**  Measurement, Time and Money | **Task Title:** What’s Missing (Coins)  Return to [Table of Contents](#Grade_One_Table_of_Content)  [Return to K-5 Overview](#Overview_of_K_5_Units) |
| --- | --- |
| **State Standards Addressed** | 1.MDA.6 Identify a penny, nickel, dime and quarter and write the coin values using a .  symbol. |
| **Mathematical Process Standards Addressed** | 1c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. 3a. Construct and justify a solution to a problem. 6c. Use appropriate and precise mathematical language. |
| **Materials and Resources** | Penny, nickel, dime, quarter for each pair of students (real or plastic)  Square piece of cloth  Whiteboard for each pair  Expo marker for each pair |
| **Task Description** | ***This is a culminating activity and should only be done after the students spend time exploring all of the coins individually and had time to describe, compare and interact with the coins.***   1. Students will work in pairs. 2. A penny, nickel, dime and quarter will be laid out. 3. The coins will be covered with a cloth. 4. One of the partners will remove a coin from under the cloth and hide if from the other partner. 5. The cloth will be removed. 6. A. The other partner will have to name the coin that has been removed and name the value.   B. After several turns the students will then name the coin that is missing and write on a whiteboard the value using the cent symbol.   1. The partner that removed the coin will verify if the answer is correct or incorrect and show the coin to the partner. 2. The coin will be returned to the group of coins. 3. The partners will switch roles. 4. This task will continue for a predetermined amount of time. 5. Once partners have mastered this skill, removing one coin, they can then try removing 2 coins at a time.   **E-Learning Modification:** Students can use real money and play this game at home with a family member. |
| **Equitable Access** | Students can decide which coin to remove and hide.  **Early Entry Point:** For students that are struggling with coin names and values a reference with coin names and values can be used as a references as they have experiences making connections  **Foundational Entry Point**: Students that can express the value of each coin can be challenged to express the value of two coins combined. |
| **Mathematical Vocabulary** | penny  nickel  dime  quarter  cent |
| **Student Reflection** | This task allows students to name coins. The student naming the coin has to be able to identify the remaining coins and also name the missing coin. The student who removed the coin has to be able to identify the missing coin so the guessing student’s response can be verified. |

Return to [Table of Contents](#Grade_One_Table_of_Content)