**Model Lesson Plan:** This lesson should be adapted, including instructional time, to meet the needs of your students.

|  |  |
| --- | --- |
| **Background Information** | |
| **Content/Grade Level** | Mathematics/Grade 1  Domain-1.NBT-Number and Operations in Base Ten  Cluster- Understand Place Value |
| **Unit** | Understand Place Value |
| **Essential Questions/Enduring Understandings Addressed in the Lesson** | **Essential Questions**   * How does using the base ten system make it easier for me to count? * How does the place value system work? * How do I determine the most efficient way to represent a number (pictorial, symbolic, with objects) for a given situation? * In what ways can items be grouped to make exchanges for unit(s) of higher value?? * How does the position of a digit in a number affect its value? * In what ways can numbers be composed and decomposed?   How are place value patterns repeated in numbers  **Enduring Understandings**   * There are many ways to represent a number. * The numbers from 11 to 19 are unique since they don’t follow the pattern of naming tens and then ones. * Grouping (unitizing) is a way to count, measure, and estimate. * Place value is based on groups of ten (10 ones = 10 and 10 tens = 100). |
| **Standards Addressed in This Lesson** | 1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones:  1.NBT.B.2a 10 can be thought of as a bundle of ten ones –called a “ten”.  1.NBT.B2b The numbers from 11 to 19 are composed of a ten and one, two three, four, five, six, seven, eight, or nine ones.   * **Teacher note:** *Students develop an understanding of this concept at different rates***.** *Some students may count the total by ones while others count by tens. Provide students with multiple opportunities to count by tens.* |
| **Lesson Topic** | Understanding place value by representing and comparing two-digit numbers from 11 to 19 with the most efficient strategy. |
| **Relevance/Connections** | It is critical that the Standards for Mathematical Practices are incorporated in ALL lesson activities throughout the unit as appropriate. It is not the expectation that all eight Mathematical Practices will be evident in every lesson. The Standards for Mathematical Practices make an excellent framework on which to plan your instruction. Look for the infusion of the Mathematical Practices throughout this unit. |
| **Student Outcomes** | The student will:   * Represent two-digit numbers using base ten manipulatives, pictures, symbols, and/or objects. * Identify and explain the value of a digit in the different positions within a number. * Understand that the position of a number affects its value. |
| **Prior Knowledge Needed to Support This Learning** | * Demonstrate and understanding of counting on. * Demonstrate some understanding of grouping objects. * Demonstrate one to one correspondence. * Demonstrate an understanding that 10 ones is equal to one ten. |
| **Method for determining student readiness for the lesson** | * Grasp the concept of bundling groups of ten. |
| **Materials** | * A Fair Bear Share by Stuart J. Murphy * counters such as beans, connecting cubes, bears, or paper clips, or pennies and dimes *(If virtual manipulatives are available through the use of an Interactive white board, these should be offered as well)* * a way to record a number, such as dry erase boards and dry erase markers, or pencil and paper * white board or chart paper * Resource Sheet 1: Two Ten Frames (one per student) * Document camera or overhead projector (optional) * Chart paper to create a 3-column chart as a class (see activity 1 for example) * manipulative that can be snapped together, such as connecting cubes or snap cubes * Resource Sheet 2:Tens/Ones Work Mat * Resource Sheet 3: Tens and Ones Exit Slip * Index card to use as an exit ticket |

| **Learning Experience** | | |
| --- | --- | --- |
| ***Component*** | ***Details*** | ***How will this experience help students to develop proficiency with one or more of the Standards for Mathematical Practice? Which practice(s) does this address?*** |
| ***Motivation*** | * As a pre-assessment, provide students with manipulatives such as beans, straws, counters, or cubes. * Ask students to place items into groups of 10. * Students who are successful will be ready to begin the activity. * Read A Fair Bear Share by Stuart J. Murphy to the class. * Discuss how the bears in the story arranged and counted the food they gathered. | MP5. Use appropriate tools strategically using physical models.  MP6. Attend to precision by striving for accuracy in representing their quantity (11-19) as tens and ones. |
| ***Activity 1***  UDL Components   * Multiple Means of Representation * Multiple Means for Action and Expression * Multiple Means for Engagement   Key Questions  Formative Assessment  Summary | UDL Components   * **Representation** is present in the activity through the use of a chart and a double ten frame mat. * **Expression** is present in the activity through the use of choices in how students physically interact with materials (when possible) and the use of the Think-Pair-Share Strategy. * **Engagement** is present in the activity through the use of an exit ticket that allows students to self-reflect on their understanding of the activity. * Have students share strategies for how they obtained their total in the pre-assessment. Record students’ responses on a chart. (Possible responses: counting by ones, counting by twos, counting by fives, counting by tens and ones). * Ask students, “Which strategy is the fastest for finding your total? Why?” * Ask students to count out a pile of counters (varying the amount from 11-19). * Students count the total and write the number on their dry erase boards. * Distribute Resource Sheet 1: Two Ten Frames to each student. * Have students display their number on the ten-frames. (Teacher note: Circulate to assist students in placing one manipulative in each space on the ten-frame, or have a student model how to do it on a document camera or overhead projector). * Ask students to identify how many groups of ten they have and how many are left over (ones). * Students should identify the total. * Ask students to share out their total and their groups of tens and ones left over. * Make a chart as a class to show the tens and ones for the numbers 11-19. (Use a simple 3-column chart to record the number in standard notation, the groups of tens and the ones left over in order from 11 to 19.) * Have students share the strategy for finding the total. * Ask students to practice counting each total shared, starting with the group of ten and counting on with the ones. (For example, if a student had a total of 13, they would say ten, eleven, twelve, thirteen...)  |  |  |  | | --- | --- | --- | | Standard Notation | Tens | Ones | | 11 | 10   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  | | 1   |  | | --- | |  | | | 12 | 10   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  | | 2   |  | | --- | |  |      |  | | --- | |  | |  * Ask why counting tens and ones is a good strategy. * Have students choose a partner. The first partner counts her total by ones and the second partner counts his total by tens and ones. Share out which counting method was more efficient.   Key Questions:   * What patterns do you notice? * How many groups of ten do you have in your number? * How many ones? * Does counting by groups of ten help you find the total more quickly? Why?   Formative Assessment:   * Teacher should observe students as they work and keep a checklist to monitor their progress throughout the unit. * Distribute an index card to students. Ask them to draw a smiley face, straight face, or frowning face based on how well they understood the lesson. Students should be encouraged to write about what they did or did not understand about the lesson. | MP1. Make sense of problems and persevere in solving them by identifying and executing appropriate strategies to solve the problem.  MP3. Construct viable arguments and critique the reasoning of others by seeking to understand alternative approaches suggested by others, justifying their conclusions, communicating them to others and responding to the arguments of others.  MP2. Reason abstractly and quantitatively by making sense of quantities 11-19.  MP6. Attend to precision by striving for accuracy in representing their quantity (11-19) as tens and ones.  MP7. Look for and make use of structure by describing and generalizing a pattern orally, symbolically, graphically and in written form for how they represented their quantity 11-19 as tens and ones. |
| ***Activity 2***  ***Motivation:***  UDL Components   * Multiple Means of Representation * Multiple Means for Action and Expression * Multiple Means for Engagement   Key Questions  Formative Assessment  Summary | *During this activity, students will work through five different experiences (counting in units, comparing heights of towers, comparing cubes in ten-frames and grouping in tens and ones and writing in standard notation) with a partner to compare two numbers between 11-19. This builds understanding of tens and ones and comparing quantities of numbers. You may wish to vary the numbers some students compare during each activity based on the student readiness.*   * Distribute connecting cubes in varying quantities from 11-19 to each student. * Ask students to count how many connecting cubes they have. Ask them to compare their total to a partner’s total. * Have students create a tower with their connecting cubes to show the total. * Ask students to compare their tower with their partner’s tower. * Ask students which strategy was easier for them to determine the total: counting all cubes or comparing the two towers?   UDL Components   * **Representation** is present in the activity through the use of five different experiences that allow them to compare numbers. * **Expression** is present in the activity through the use of concrete materials (as well as virtual manipulatives when possible). * **Engagement** is present in the activity through the use working with and sharing ideas with a partner.   **Activity:**   * Students work in pairs for this activity. * Distribute Resource Sheet 1: Two Ten Frames to each student. Have them place the connecting cubes in the ten frames. * Students compare their ten-frame to a partner’s to determine who has more cubes. * Partners discuss how they know who has more cubes by identifying the group of tens and ones left over. Ask the students to compare how their numbers are the same and/or different from their partners. * Ask students to snap their connecting cubes into a tower of ten cubes. (Explain that we call this tower a “ten”). * Have students snap their connecting cubes into a tower and move the tower into the Tens Place on Resource Sheet 2: Tens/Ones Work Mat * Ask students to move the ones from the ten-frame into Ones Place on the work mat. * Discuss with students how their number is represented on the work mat (For example, one ten and 3 ones). * Now have students compare their tens and ones on their work mat with their partner’s. Encourage students to compare tens and ones. * Have students write the number in standard notation at the bottom of their work mat that represents their number of Tens and Ones. * Circulate and assist students in writing the number in standard notation. Ask each student how their total number is represented as tens and ones and in standard notation. * Allow time for a few students to share or to come up to the board to record their solutions. If the use of an Interactive white board is available, display a double ten frame and allow students to use virtual manipulatives when sharing their ideas. * Ask students, “What are the different ways we represented our number?” (Individual connecting cubes, towers, ten-frames, Tens/Ones work-mat, standard notation). * Revisit the chart from Activity 1. Ask students, “Can you tell me any patterns that you notice?” * Ask students to share the number they represented and find it on the chart. * Have students identify the amount of tens and ones for their number. * Ask students, “What is the difference between the tens and ones on our work-mat?” * You may need to review with some students that numbers from 11 to 19 can be written as 1 ten and some ones. We write the number 1 to represent the number of tens and another numeral 0-9 to represent the number of ones.) * Ask students, Could we write 13 as 31? Why or why not?” Discuss with students that because 13 has 1 ten and 3 ones, the number must be written with a 1 on the left, which is the tens place and a 3 on the right, which is the ones place.   **Enrichment**:   * In a journal, ask students to write about place value. Ask, “If you had a choice to have some tens and some ones, how many would you choose of each and how many would you have altogether? Why? “ | MP1. Make sense of problems and persevere in solving them b representing and comparing quantities in a variety of ways.  MP2. Reason abstractly and quantitatively by making sense of quantities and their relationships and using varied representations and approaches when solving problems.  MP4. Model with mathematics by applying the mathematics they know to solve problems and make assumptions and approximations to simplify a complicated situation.  MP7. Look for and make use of structure by generalizing and describing a pattern to represent the tens and ones of a quantity and compare it to another quantity.  MP8. Look for and express regularity in repeated reasoning by look for mathematically sound shortcuts to represent tens and ones. |
| ***Closure*** | Resource Sheet 3: Tens and Ones Exit Slip   * Have students complete the exit slip independently to demonstrate understanding of how to represent numbers 11 to 19 as tens and ones.   Enrichment:   * Use the same exit slip except allow students to select their own two-digit number to identify the groups of tens and ones left over. | MP1. Make sense of problems and persevere in solving them by identifying and executing appropriate strategies to solve the problem.  MP2. Reason abstractly and quantitatively by making sense of quantities and their relationships in problem situations.  MP3. Construct viable arguments and critique the reasoning of others by communicating their ideas to others.  MP4. Model with mathematics by applying the mathematics they know to solve problems.  MP6. Attend to precision by communicating their understanding of mathematics to others and striving for accuracy. |

|  |  |
| --- | --- |
| **Supporting Information** | |
| **Interventions/Enrichments**   * Students with Disabilities/Struggling Learners * ELL * Gifted and Talented | Activity 1 Enrichment:   * Have students partner up and combine their manipulatives to see how many groups of ten can be made and how many ones are left over. Have students discuss the efficient strategy used that helped them find the total.   Differentiated Key Question Activity 1:   * How did making groups of ten help you find the total?   Activity 2 Intervention:   * Some students will experience difficulty with understanding that a group of ten can be represented as a single quantity, 1 ten. Provide students with many opportunities to count objects and use a ten-frame to visualize and count a group of ten.   Activity 2 Intervention:   * Some students may need more work with counting and grouping.   Activity 2 Enrichment:   * Have students think through the following situation. If you had a choice to have some tens and some ones, how many would you choose of each and how many would you have altogether?   Closure Enrichment:   * Use the same exit slip except allow students to select their own two-digit number to represent groups of tens and ones. |
| **Technology** | <http://illuminations.nctm.org/ActivityDetail.aspx?ID=218> (activity helps students with grouping, tally marks, and place value)  <http://www.factmonster.com/math/knowledgebox/player.html?movie=sfw44801>  Pearson Digital Resources: Fact Monster (Tens of Marshmallows) |
| **Resources**  (must be available to all stakeholders) | See Unit resource link |

Resource Sheet 1  **Two Ten Frames**

Resource Sheet 2  **Tens/Ones Work Mat**

|  |  |
| --- | --- |
| Tens | Ones |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

Resource Sheet 3 Tens and Ones Exit Slip

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Directions:*** Represent the number 16 as tens and ones. You may use numbers, pictures, and/or words.