**Changing Numbers**

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| **This is lesson two in a series of six lessons focused around developing a mathematical community at the beginning of the school year. While this lesson addresses standard NC.1.NBT.7, its primary goal is for students to learn how to work with classmates on activities related to counting and number sense and engage in real-world math situations.** |

**NC Mathematics Standards:**

**Extend and recognize patterns in the counting sequence.**

**NC.1.NBT.7** Read and write numerals, and represent a number of objects with a written numeral, to ~~100~~ 20.

**NC.1.NBT.1** Count to 150, starting at any number less than 150.

**Standards for Mathematical Practice:**

1. Make sense of problems and persevere in solving them.

4. Model with mathematics.

6. Attend to precision.

**Student Outcomes:**

* I can work with a partner to solve math problems.
* I can count on from a given number within 100.
* I can explain the process of solving a problem to my teacher and classmates.

**Math Language:**

* Count, count on, next, ones, ten

**Materials:**

* Bags (paper), Cube bags activity sheet, Twenty board, Multi-link (pop) cubes, Number cards, Pattern blocks, Ten Frames, Two-color counters

**Advance Preparation**:

* Gather materials
* Prepare 15 cube bags. Each bag should have between 1 and 20 cubes in it.

**Launch:**

1. Introduce the word ***communication***.
* Ask: *What does the word communication mean to you?*
* Allow students to respond with their ideas. If you want you can record them.
* Say: *Mathematicians communicate their ideas and strategies with one another.*
* Explain: *Many times mathematicians need to work together to solve problems.*
1. Introduce the task.
* Read the task to students: ***There are 2 children in the park. Then 6 more children come to the park. How many students are now in the park?***
* Provide students with counters and ten frames to work on the task. Give students 3-5 minutes to work on the task with partners.
* Ask students:
	+ *What strategies did you use to solve the task?*
	+ *How do you know your answer is correct?*
	+ *If we were going to draw a picture about how we solved the problem, what would our picture look like?*
	+ Students may say:

“I drew 2 circles and then drew 6 more circles.”

“I wrote the numbers 1, 2 and then the numbers 3, 4, 5, 6, 7, 8.”

* Read the follow up task. ***There are 8 children in the park. Then 2 of them go home. How many children are now in the park?***
* Provide students with counters and ten frames to work on the task. Give students 3-5 minutes to work on the task with partners.
* Ask students:
	+ *What strategies did you use to solve the task?*
	+ *How do you know your answer is correct?*
	+ *If we were going to draw a picture about how we solved the problem what would our picture look like?*
	+ Students may say:

“I drew 8 children and then crossed 2 of them out.”

“I wrote the numbers 1 to 8, then I crossed out 8 and 7.”

* As you conclude this phase say: *It is important that mathematicians communicate to others about the strategies that they use.*

**Explore**

1. Introduce Changing Numbers to students.
* Have a student come to the front of the class to model the activity with you.
* *You and your partner are going to have a set of number cards, a ten frame, and counters.*
* Directions:

A student draws a number and builds that number on the ten frame. *Example: A 4 on the card means 4 counters on the ten frame.*

The partner then draws another card and then has to change the picture to match the new card. *Example: A 7 on the card means you would add counters to the picture to get 7.*

On the recording sheet the students fill in the chart. *Example: Start number: 4, New number: 7. Change: I added 3 more.*

Partners then talk to each other. *We started with \_\_. We changed it to \_\_ by \_\_\_\_\_\_ .*

The game continues.

1. Playing Changing Numbers
* Allow students 10-12 minutes to work on the activity.

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| **Observation** | **Questions to Ask** |
| Students clear off the ten frame and build the new number from 0.  | * *How can we change our picture without having to start over with a blank ten frame every time?*
* *Can we count the counters that are already on the ten frame?*
 |
| Students are not able to accurately count objects. | * *How can we organize our counters to help us count them accurately?*
* *Will moving the counters after we count them help us?*

If needed, you could provide a number line to students and have them use that instead of ten frame to provide more support.  |

**Discuss:**

1. Bring students together to discuss their strategies on the changing numbers activity.

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| **Sample Questions** | **Possible Responses** |
| * *How did you determine how to change the picture on your ten frame?*
 | * The new number was larger so I knew I had to add counters.
* The new number was smaller so I knew I had to remove counters.
 |
| * *How did you determine how many counters to add?*
 | * I added counters and kept recounting until I reached the new number.
* I removed counters and kept recounting until I reached the new number.
 |

1. Say: *One of the things that mathematicians do is talk about their strategies. Can you help me complete this sentence? I can change the number 3 to the number 7 by \_\_\_\_\_\_\_\_.*

**Additional Activities:**

These activities can either be done by everyone in the class or as part of centers/math workshop.

 **Start with/Get to**

Students pull a number card and make a pile or tower of that many multi-link (pop) cubes. Students then pull another number card and change their pile so that the new pile has as many multi-link (pop) cubes as the new number card. Students can record their start number and new number and how they changed it in their math journal. Example:

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| **Start number** | **New number** | **Change**  |
| 3 | 5 | Put 2 more in  |
| 8 | 7 | Took one out |
| 9 | 9 | No change |
| 2 | 8 | Put 6 more in  |

 **Build It, How Many More to Make Ten**

Students need a ten frame, a set of number cards, and either counters or cubes. Students draw a number card. Then, they put that number of counters on their ten frame. Lastly, students determine how many more they need to add to make 10. Students use the recording sheet to keep track of their work.

**Pattern Blocks Grab**

Students will reach into a bag or bucket full of pattern blocks. Students will then sort the blocks by shape and count how many of each shape they have. Students repeat this activity.

**Evaluation of Student Understanding:**

**Informal Evaluation:**

* Observe and ask questions as students are completing the Changing Numbers activity. Make note of students’ strategies during the activity.
* Since this is one of the first lessons of the year it is important to make note of which students work well together, which students take the initiative to get started, and which students need additional support.

**Meeting the Needs of the Range of Learners:**

**Interventions:**

* For students who struggle give them cube bags with less than 10 objects inside.

**Extensions:**

* Allow students to work with numbers 21-30 if they are able.

**Possible Misconceptions/Suggestions:**

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| **Possible Errors****and Misconceptions** | **Suggestions** |
| Students clear off the ten frame and build the new number from 0.  | * *How can we change our picture without having to start over with a blank ten frame every time?*
* *Can we count the counters that are already on the ten frame?*
 |
| Students are not able to accurately count objects. | * *How can we organize our counters to help us count them accurately?*
* *Will moving the counters after we count them help us?*

If needed you could provide a number line to students and have them use that instead of ten frame to provide more support.  |

**Special Notes:**

* This was an introductory lesson, with the intended goal of learning how to communicate about strategies with partners.
* The Additional Activities can be completed as centers at various times during the year.

Changing Numbers Recording Sheet

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| Old Number | New Number | How you changed your number? |
| *5* | *8* | *I added 3 counters.*  |
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Primary Number Cards Page 1 of 2

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| **0** | **1** | **2** | **0** | **1** | **2** |
| **3** | **4** | **5** | **3** | **4** | **5** |
| **6** | **7** | **8** | **6** | **7** | **8** |
| **9** | **0** | **1** | **9** | **0** | **1** |
| **2** | **3** | **4** | **2** | **3** | **4** |

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| **5** | **6** | **7** | **5** | **6** | **7** |
| **8** | **9** | **0** | **8** | **9** | **0** |
| **1** | **2** | **3** | **1** | **2** | **3** |
| **4** | **5** | **6** | **4** | **5** | **6** |
| **7** | **8** | **9** | **7** | **8** | **9** |

Ten Frame

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Ten Frame

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