**What is Math?**

|  |
| --- |
| **This is lesson one 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, 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 ***mathematician***.

* Say: *Mathematicians solve problems*. *During our daily math time, we will be mathematicians and solve problems with objects, shapes, and numbers.*
* Explain: *Many times mathematicians need to work together to solve problems.*

1. Introduce the task.

* Read the task to students: ***There are 4 children in the park. Three more students come to the park. If Sonya gives each student a number, what numbers will Sonya give the 3 students who showed up?******Use your twenty board and counters to prove your answer.***
* Provide students with 3-5 minutes to work on the task. Students should work in partners to find the next 3 numbers (5, 6, 7).
* Write the following so students can see it: 4, \_\_\_, \_\_\_, \_\_\_\_
* Ask students:
  + *What numbers go in the blanks?*
  + *How did you find out the next 3 numbers?*
  + *How can the twenty board help you?*
* Pose the follow up task. ***There are 8 children in the cafeteria. Four more students come in. If Stefan gives each student a number what numbers will Stefan give the 4 children who came in? Use your twenty board and counters to prove your answer.***
* Provide students with 3-5 minutes to work on the task. Students should work in partners to find the next 4 numbers (9, 10, 11, 12).
* Write the following so students can see it: 8, \_\_, \_\_, \_\_, \_\_
* Ask students:
  + *What numbers go in the blanks?*
  + *How did you find out the next 4 numbers?*
  + *How can the twenty board help you?*
  + *What happened after 8 on the twenty board?*

**Explore**

1. Introduce the Cube Bags 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 cube bag. You are going to look at your bag and estimate how many cubes are in the bag. All of the bags have less than 20 cubes.*
* *On your recording sheet you are going to write the letter of your bag and your estimate.*
* Then we are going to empty the bag and count how many cubes we have.
* Model how to count the cubes and record the number on the recording sheet.

1. Counting the Cube Bags

* Allow students 10-12 minutes to work on the activity.
* Make sure you have established a system for students to return a bag and grab a new bag after they are done estimating and counting.

|  |  |
| --- | --- |
| **Observation** | **Questions to Ask** |
| Students struggle estimating the number of cubes. | * *How many cubes do you think there are?* * *Do you think there are more than 10 or less than 10 cubes? Why do you think that?* |
| Students are not able to accurately count objects. | * *How can we organize our cubes to help us count them accurately?* * *Will moving the cubes after we count them help us?* |

**Discuss:**

1. Bring students together to discuss their strategies on the cube bag activity.

|  |  |
| --- | --- |
| **Sample Questions** | **Possible Responses**  **(in order of least to most sophisticated)** |
| * *How did you determine how many cubes were in the bags?* | * I moved each cube as I counted. * I lined them up and counted them. * I counted them while they were in a pile. |
| * *Did you count by 1s or groups of objects?* | * Answers will vary. Use follow up question to promote the idea that students could have counted objects 2 at a time. |

1. Say: *One of the things that mathematicians do is talk about their strategies. Can you help me complete the sentence? Today I found out how many cubes were in my bag 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:

|  |  |  |
| --- | --- | --- |
| **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 counting their cube bags. Make note of specific strategies they use to count and if they have maintained their counting skills from Kindergarten.
* 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:**

|  |  |
| --- | --- |
| **Possible Errors**  **and Misconceptions** | **Suggestions** |
| Students struggle estimating the number of cubes. | * *How many cubes do you think there are?* * *Do you think there are more than 10 or less than 10 cubes? Why do you think that?* |
| Students are not able to accurately count objects. | * *How can we organize our cubes to help us count them accurately?* * *Will moving the cubes after we count them help us?* |

**Special Notes:**

* This was an introductory lesson, with the intended goal of learning how to work on a math task/activity with a partner.
* The Additional Activities can be completed as centers at various times during the year.

Cube Bags Recording Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Bag | Estimate | Number of Cubes | How far from 20? |
| *Z* | *13* | *14* | *6* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Primary Number Cards Page 1 of 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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** |

Page 2 of 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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** |

Twenty Board

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Twenty Board

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Ten Frame

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

Ten Frame

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |