**What Do You Like?**

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| This lesson is focused around developing a mathematical community at the beginning of the school year. While this lesson addresses standard NC.3.MD.3, the 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:**

**Measurement and Data: Represent and interpret data.**

**NC.3.MD.3** Represent and interpret scaled picture and bar graphs:

* Collect data by asking a question that yields data in up to four categories.
* Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.
* Solve one and two-step “how many more” and “how many less” problems using information from these graphs.

**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 pose questions and collect data from my classmates.
* I can create a table and graph to represent data.
* I can communicate with others about my data.

**Math Language:**

* Bar graph, data, question, picture graph, scale

**Materials:**

* Paper, pencil, activity sheets, number cards

**Advance Preparation**:

* Gather materials

**Launch:**

1. At the Fair Graph and Task Introduction (15-20 minutes)

Ask: “Who has been to a fair before?” What do you see at a fair? What do you hear? What do you smell? If students have no experiences with fairs, you may wish to [show this brief video about food at the NC State Fair](https://www.wral.com/entertainment/statefair/video/14965248/) to activate prior knowledge or to provide some background.

Display the graph At the Fair (below) for the class to see. Ask:

* *What type of data could be represented by this graph?*
* *What types of labels do we need on the graph?*

Tell the class that the graph was people’s favorite food at the fair and the choices were: Caramel Apples, Cotton Candy, Funnel Cakes, and Turkey Legs.

Say, “Work with your table to come up with 3 questions about the data in the table.”Have a few groups share their questions with the class. Discuss that the graph can help us answer these questions. Students work in pairs or groups to answer their classmates’ questions.

Introduce the task. Tell students that today they are going to create a question with four answer choices.

**Explore:**

1. Generating a question and collecting data (30 minutes)

Pair students up and have them talk and come up with their own question with 4 possible choices. If students are stuck you could suggest that they pick one of these topics and come up with their 4 choices:

* Favorite breakfast food
* Favorite dinner food
* Favorite type of cookie
* Favorite type of ice cream
* Favorite sport
* Favorite TV show
* Favorite board game

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| **Observation** | **Questions to Ask** |
| Students have difficulty coming up with a question. | * “What would you like to know about your classmates?”
* “If someone were going to ask you a question about yourself what would you want them to ask you?”
 |
| Students have difficulty coming up 4 possible choices. | * “How can we come up with 4 choices that your classmates are likely to choose?”
* “What are some choices you think your classmates would choose?”
 |

Once students have told you their questions and 4 answer choices they can complete part 1 of the Tell me about… activity sheet.

Ask students, “How can we keep track of who has answered our question?” Have students brainstorm possible ways to keep track. Remind students that they need to keep track of their data as well as who they have asked their question to.

Students then spend time asking each other their answer to their questions. You could have students do this by having them all move around the room asking each other. The goal is for students to collect data from at least 12 classmates if possible.

As students collect data observe them and ask questions to support them. Make sure students are keeping track of their data on the activity sheet. This provides teachers with a chance to informally assess their students, e.g. who interacts well with others in the class, who is keeping track of the data, who needs prompting to work independently, etc.

**Discuss:**

1. Discussing our data (15 minutes)

Bring students together on the carpet (they need their activity sheets).

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| **Sample Questions** | **Possible Responses or Talk Frames** |
| * What was something interesting you learned today about your classmates?
 | * “An interesting fact that I learned was that my classmates \_\_\_\_\_\_.”
 |
| * What does your data tell you about the class?
 | * “I learned that my classmates’s favorite \_\_\_ is \_\_\_ and their least favorite \_\_\_ is \_\_\_\_.”
 |
| * Did you have any trouble keeping track of who had answered your question? How did you keep track of your data?
 | * “I had a hard time determining who I had asked until I starting writing names down on my paper.”
* “I wrote down names and their choice at the same time. That helped a lot.”
 |
| * Why is it important when we collect information to be certain we ask the same person the question only once?
 | * “If someone gets more votes than other people our data won’t be right.”
* “If we want to find out the class’ favorite and least favorite everyone should only get one vote.”
 |
| * Who would like to share your question and tell us about the results?
 | * Responses will vary based on the question and data.
 |

Conclude the discussion by saying, *Think about what we did today. Can you help me finish the sentence “Mathematicians are people who \_\_\_\_\_\_\_\_\_\_\_\_.”*

**Additional Activities:**

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

 **Making a Graph of Our Data**

Provide graph paper to students and have them create a bar graph of their data. Depending on when you teach this lesson you could have students use a scale of 1 or a scale of 2. When they are done students should write 2 statements of their data. One of them should be a “how many more” or “how many fewer” statement such as, “In the data 4 more students preferred caramel apples compared to funnel cakes.”

**What do you like?**

Students select another question and pose that question to either small group then or the class on another day. The teacher could have students create questions and choices and then the questions could be used as a Daily Math Routine over the next few weeks.

 **Close to 1000**

Students need number cards (provided below) and either a recording sheet or their math journal.

 Directions:

* 1. Students play with partners or in groups of 3. Each student gets 8 cards.
	2. They use 6 of their 8 cards to make 2 3-digit numbers that will add up to 1,000 or as close to it as possible.
	3. Their score is their difference from 1,000. For example, if they had a sum of 1,006 then their score would be 6.
	4. Students get 6 new cards so they always start with 8.
	5. Students continue to play. The lowest score wins.

**Evaluation of Student Understanding:**

**Informal Evaluation:**

* Observe students and ask questions as they are collecting data. Look for students who may need more support keeping track of their data.
* Note how they answered the questions and the strategies they use to solve the questions.

**Formal Evaluation:**

* Students’ work from the Explore activity or the Making a Graph additional activity could be used as a formal evaluation.
* If you would also like to give an exit ticket you can redisplay the At the Fair from the beginning of the lesson and ask “How many fewer people prefer caramel apples than funnel cakes?”

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

**Interventions:**

* For students who struggle coming up with categories give them options for questions and also choices.
* For students who struggle creating a graph with a scale of 2 have them use 1 box on the graph paper for each number on the scale but only have them label the even numbers.

**Extensions:**

* Students can explore different scales for their graphs besides 2.

**Possible Misconceptions/Suggestions:**

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| **Possible Errors****and Misconceptions** | **Suggestions** |
| Students have difficulty coming up with a question. | * “What would you like to know about your classmates?”
* “If someone were going to ask you a question about yourself what would you want them to ask you?”
 |
| Students have difficulty coming up 4 possible choices. | * “How can we come up with 4 choices that your classmates are likely to choose?”
* “What are some choices you think your classmates would choose?”
 |

**Special Notes:**

* The At the Fair activity in the Launch section can be used multiple times during the year.
* The Additional Activities can be used at multiple times during the year.
* As written, students will not collect data from enough people to have numbers large enough to meet the full expectation of this standard. Consider providing other opportunities to analyze graphs with larger data sets to solve how many more/how many less problems to meet the full expectation for third grade students as they answer questions about graphs.

**At the Fair**

**At the Fair (with Labels)**

Caramel Cotton Funnel Turkey
Apples Candy Cakes Legs

**What Do You Like?**

|  |  |
| --- | --- |
| **Category** | **Tallies** |
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How many people voted?

What was the difference between the most popular and least popular food?

Write another question below and answer it based on your data.

Number Cards Page 1 of 2 (for Close to 1000 additional activity)

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

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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** |