**Introducing Collecting Data**

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| This lesson provides students with opportunities to become introduced to collecting data about their classmates’ favorite food. |

**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. Totaling Tallies and Introduce the Task (12-15 minutes)

Display the Totaling Tallies picture (below) for the class to see. Ask questions such as:

* *What do you notice in the chart?*
* *What do you wonder about the chart?*
* *What type of data do you think is on the chart?*
* *What questions could we ask about the data on the chart?*

Tell the class that the chart shows data about students’ favorite topics to read about. Display the next chart which has the labels. Have students work together to respond to the questions in pairs or small groups. After discussing the questions tell students, “*I want you to 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. Tell students that today they are going to create a survey and ask our students about their favorite food.

**Explore**

1. Collecting Data (30 minutes)

Pair students up and have them talk and come up with their own question with 4 possible choices about their favorite food. 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 lunch food
* Favorite dinner food
* Favorite type of cookie
* Favorite type of ice cream

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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 Favorite Food Recording 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 should 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 \_\_\_\_\_\_\_\_\_\_\_\_.”*

**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.

**Formal Evaluation:**

* Students’ work from the Explore activity could be used as a formal evaluation.
* If you would also like to give an exit ticket you can redisplay the Totaling Tallies graph and ask a follow up question about the data. You can pose a combination question such as “How many people voted for either \_\_\_ or \_\_\_?” You can pose a comparison question such as, “How many more/fewer people voted for \_\_\_\_\_ than \_\_\_\_\_\_.”

**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 keeping track of who they collected data from have them collect data from only a smaller group of students.

**Extensions:**

* Students can explore other ways to display their data such as a numerical table or start to work with bar graphs.

**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 activity in the Launch section can be used multiple times during the year.

Totaling Tallies

* 49 people voted, the difference is 11 votes.

**Totaling Tallies without Labels**

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What do you notice?

What do you think the data is about?

**Totaling Tallies**

What do you like to read books about?

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| --- | --- |
| People |  |
| Animals |  |
| Sports |  |
| Stories about Children |  |

What do you notice?

How many people voted?

What is the difference between the most popular subject of books compared to the least popular?

**Favorite Food Recording Sheet**

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| **Food** | **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.