Mathematics: The Language of STEM
The Votes Are In!
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CONTENT AND TASK DECISIONS

Grade Level(s): 2nd, 3rd

Description of the Task: Students will survey classmates, collect data, and place this data in a table or graph of their choosing. Students will use this collected data to compare the results, finding out which choice received the most votes, least votes, etc.

Indiana Mathematics Content Standards:
2.DA.1: Draw a picture graph (with single-unit scale) and a bar graph (with single-unit scale) to represent a data set with up to four choices (What is your favorite color? red, blue, yellow, green). Solve simple put-together, take-apart, and compare problems using information presented in the graphs.
3.DA.1: Create scaled picture graphs, scaled bar graphs, and frequency tables to represent a data set—including data collected through observations, surveys, and experiments—with several categories. Solve one- and two-step "how many more" and "how many less" problems regarding the data and make predictions based on the data.

Indiana Mathematics Process Standards:
PS.1: Make sense of problems and persevere in solving them.
PS.2: Reason abstractly and quantitatively.
PS.3: Construct viable arguments and critique the reasoning of others.
PS.4: Model with mathematics.
PS.5: Use appropriate tools strategically.

Mathematics Content Goals: Students will understand that data can be organized in a table or graph in order to make it easier to see patterns in the information and infer what that data means. They will then use this data to solve comparison problems.

Language Objectives: Students will orally explain the results of their survey and how that data helps them solve the posed math problem.

Materials: food pictures, survey forms, clipboards, markers, colored pencils, poster board, enough treats of the winning food to give to each participating class

THE LESSON

Before:

- Student Actions
  1. Watch a short clip on voting. https://www.youtube.com/watch?v=clwNdZggYcI (This is a clip from Sesame Street. Use for younger classes.) https://www.youtube.com/watch?v=HmK5jO7yigk (This is a clip that focuses more on electing a president and why a person should vote.)

2. Turn and talk to your partner about a time you made a choice. What did you choose? What were your options? Were you happy with your choice? What or who helped you make your decision?

- Teacher Actions
  1. Briefly discuss the idea of voting. Point out that when people vote, usually they are only allowed to vote once and are only allowed to choose one item, idea, or person. Choose a few students to share a time when they made a choice.
  2. Say: "Voting is simply making a choice between options, such as when you choose chocolate milk, juice, or white milk each day for snack. When I record this information, I am collecting your answer or vote. This process is called "polling"." Write this term on the board.

During:

- Student Actions

  1. Students will vote on their favorite circus food. You may have students raise their hands, write their choice on a ballot, or place a picture of their favorite circus food on the board.
  2. Partner groups will generate ideas on how best to organize their results.
  3. Record the results on poster board.

- Teacher Actions

  1. Now poll students: What circus foods do you like the best? Cotton candy, popcorn, circus peanuts, or hot dogs.
  2. Ask: How should we show this information/data? In what way could we organize our results?
  3. Wait for 3-5 minutes! Do not move around the room, yet. Allow students to think for themselves without teacher hints or help.
  4. After the initial "free think", travel among your groups asking open-ended questions, such as "What kind of picture will you make using the data? How will we know which food won?"

  Note: During this time of discovery students should be encouraged to organize their thoughts and the data based on what they already know. Do not overly emphasize graph construction. Many students may not have the background knowledge to make a perfectly labeled bar graph. You are first building interest, communication, and analysis

After:

- Student Actions
  1. Student groups will present their graphs to the whole class by showing their posters and explaining their results.
  2. Fellow students will be encouraged to ask questions and discuss the value of their graph or chart.

- Teacher Actions
    1. Encourage students to present their posters to the class.
    2. Ask questions like, “Did this graph (chart or picture) tell about our data in a clear way? When you compare all the ways we organized our data, is their one way that was better? Easier to understand and “read”?”

EXTENTION

In order to assess if students can clearly organize data, conduct a survey of other classrooms in your school. Students will go to other classrooms and ask the question: “What is your favorite circus food?” Students will record the votes on a survey form for that class. When you are back in your own classroom, follow the same procedures as listed in the lesson. Graphs and charts can be displayed on a Data Wall in your hallway. As a thank you for participating in the math survey, give voters the winning treat!

ASSESSMENT

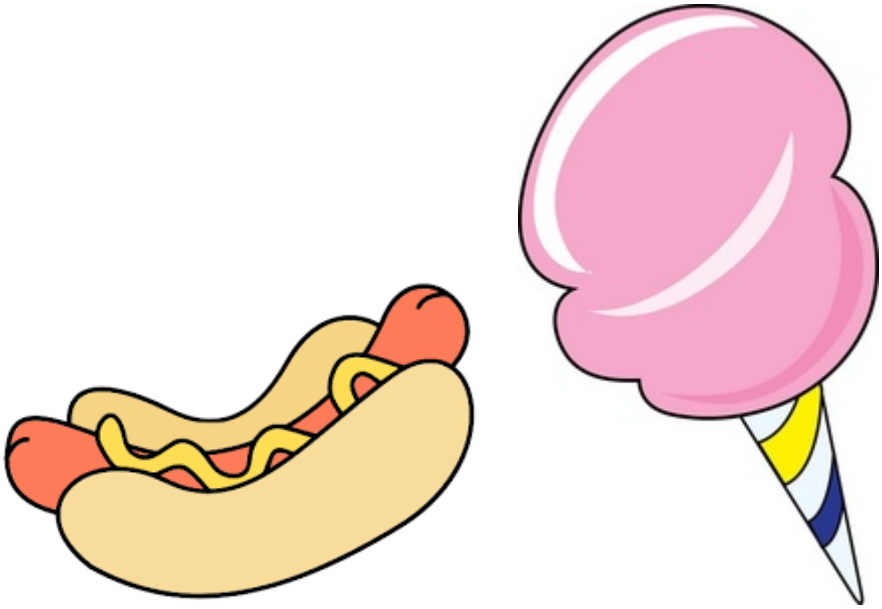
Using the collected and organized data, students will answer questions on an Exit Slip. (See example below)

REFERENCES

Elementary and Middle School Mathematics Teaching Developmentally by John A. Van De Walle; Pp.458-460

RESOURCES

Clip Art:



Hot dog courtesy of http://www.clipartpanda.com/categories/hotdog-clipart
Cotton candy courtesy of https://clipartfox.com/download/f194ed39bd17282f67b4fb75f82e855cd90e778b.html
Popcorn courtesy of http://tumundografico.com/clipart/popcorn-clipart.html
Circus Peanuts courtesy of https://www.oldtimecandy.com/blog/the-mystery-of-circus-peanuts/

Survey Form:

What is your favorite Circus food?

Popcorn	
Hot Dog	
Cotton Candy	
Circus Peanuts	

Exit Ticket:
Print one for each student.