

Improving Teacher Quality Program

Mathematics Within: Algebraic Processes and Its Connections to Geometry

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Broad Topic: Graphs

Suptopic: Bar and Pie Graphs

Grade Level: 4

Time Frame: two 45-minute sessions

Aim: To have students take a set of data and represent it in a graph.

Specific Objectives:

- Students will be able to understand how to construct two different graphs using the same set of data.
- Students will be able to interpret the graphs.
- Students will be able to see the connection between the two graphs.

Materials and Supplies:

- Graph paper
- pencils
- tape
- colored pencils
- ruler (straight edge)
- overheads and overhead pens
- scissors
- sticky notes
- chalk or dry erase markers and board

References:

- *Everyday Math*
- *Math in Context*

Day 1

Introduction:

1. Display pie graph and bar graph that have been created by using the same set of data (i.e. birthday months or favorite animal).
2. Ask student, "what did you notice?" Have students talk with a partner. How are the graphs the same? How are the graphs different? Create a Venn diagram to represent the similarities and differences as a whole group.
3. Explain to students that through these two graphs we can see that the same set of data can be represented two different ways. Ask them if they can come up with another set of data that can be represented using both a bar graph and a pie graph Brainstorm different topics.

Body:

1. Once students have agreed on a topic, draw columns for the categories on the board. Give each student a sticky note and have him or her write his or her name on it.
2. Each student is allowed to place their sticky note in the appropriate column.
3. When all the sticky notes have been placed, discuss the information on the board (# per column, greatest, least, mode, range, etc.).
4. Hand out graph paper. Take a few minutes and have the students take the information from the board and create a bar graph working in pairs.
5. Ask the students to share what they have created.
6. On an overhead, show the representation that the teacher has created. Discuss how you came up with your graph. Make sure to include the different parts of the graph (i.e. title of the graph, etc).
7. Have students replicate or fix their graph to have the same information on their graph. Each student needs to make a bar graph.
8. Collect completed bar graphs. Go through and make sure each bar graph is correct.

Day 2

Discussion:

1. "Yesterday we saw that the data from a bar graph can be represented on a pie graph. "Do you have any ideas about how that can be done?" Allow students to discuss different ideas with a partner or a small group. Then discuss the different ideas the class came up with as a whole group.
2. Facilitate by asking guiding questions so that the students arrive at cutting each piece of the bar graph out. (If they do not arrive at this technique ask them if it would be possible for us to cut the pieces out and some how use them to form a circle?)
3. Demonstrate, using the overhead, cutting out each bar, and taping the pieces together, end-to-end, without overlapping any of the pieces. Make sure to tape the final two ends together to form the circle.



4. Talk about how to transfer the data to a piece of paper. Guide them to place the circle on the paper, carefully trace the circle, and put marks where the colors meet. Remove the circle and place a center point. With a ruler/straight edge connect the marks to the center point. Have the students color in each section to match the corresponding section of the bar graph.

Closure:

1. "Can anyone tell me some things we learned about graphing? How can you use the information to help you understand a group of numbers?" (Greatest, least, range, mode, relationship between categories, etc.)
2. Have the students write down which graph they liked and list two things they can tell from that graph.

Assessment:

1. Assess the students first on their written work resulting from the "Closure" section of the lesson.
2. Then, present the students with a set of data and materials needed to represent the data. Have the students work independently to create the representations of the data (they make the graphs).

Follow Up:

1. Can this set of data be represented in a line graph?
2. How is the pie graph similar to probability? (Spinners, what is it most likely to land on, least likely, etc.)

Extension:

The bar graph portion of this activity can be completed on the computer using Excel.



