

NO BIAS ALLOWED

Performance Standard 10A.G

Analyze the differences in various graphical representations of the same data set, and discuss the possible bias present in the graphs:

- *Mathematical knowledge*: Determine differences in graphical representations to identify possible bias;
- *Strategic knowledge*: Solve problem using a systematic process;
- *Explanation*: Explain completely what was done and why it was done.

Procedures

1. Provide students with sufficient learning opportunities to develop the following in order to organize, describe and make predictions from existing data:
 - Recognize potential bias in data collection methods or data presentation.
2. Provide students with the assessment task worksheet. Have students work individually. Calculators may be used.

Two organizations have differing views on whether their salaries are equitable. One group believes their salaries are virtually the same, except for minor differences due to length of employment. The second group believes they are not being paid as well as their peers in the other group. The two groups have each taken the same data and calculated the mean salary for each group. Here are the graphical representations each group made to compare the data. Discuss which data set came from which group and why you believe this. Which data set more fairly represent the differences? Why?
3. Use the standard scoring rubric. Give each student a score in each of the three categories. A score of 4 should indicate completely correct solutions to all parts of the problem, with complete and correct justifications of their reasoning. A three should represent correct or nearly correct solutions to all parts, their rationale should be sound, but may not be completely explained. A two would indicate that students have some idea about how to answer the questions, but make errors in reasoning that effect their answers. A one may have a correct answer for one part, but generally shows little understanding in their rationale for their procedures and processes. A score of zero generally reflects no correct responses and no logical rationale for their procedures and processes.
4. Computational errors are not really applicable to this problem.
5. The students should be able to see that the data presented is the same, but that the difference in scale for the first graph is used to distort ones perspective and make the differences between the two groups appear bigger than it actually is. This is a typical attempt at distorting or biasing data to favor a point of view that wants to highlight the differences in two groups. Group A probably wants to make the point that their salaries are much lower than Group B. So the second graph probably came from group A. On the other hand, group B wants to show how close the salaries actually are, and would choose the first graphical representation. The difference between a three and a four on this task will generally be a difference in the quality of their explanations of why the second graph is considered biased reporting of the data.

Examples of Student Work not available

Time Requirements

- One class period

Resources

- Writing utensil
- Calculators may be used
- Copies of the “No Bias Allowed” task sheet
- Mathematics Rubric

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Student Task Sheet

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