BOX & WHISKERS

Performance Standard 10A.G

Describe similarities and differences in two data sets that are represented by box and whiskers plots:

- *Mathematical knowledge*: Demonstrate knowledge of box and whiskers plots (median, range), and interquartile range;
- *Strategic knowledge*: Describe similarities and differences in complete and systematic process;
- *Explanation*: Explain what was done and why it was done.

Procedures

1. Provide students with sufficient learning opportunities to develop the following in order organize, describe and make predictions from existing data.
   - Construct, read, interpret, infer, predict, draw conclusions, and evaluate data from various displays, including box and whiskers plots, and
   - Find, use and interpret measures of center and spread, including interquartiile range.
2. Provide students with the assessment task sheet. Have students work individually. Calculators may be used. The following two box and whiskers plots represent two different data sets. They have been placed appropriately above each other on the same scale. Based on the information provided in these two plots, describe how the data sets are similar and how they differ. Include as much detail as possible.
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 effects 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 applicable to this problem.
5. Since neither box and whiskers plot has been labeled, no information about the type of data gathered can be determined. However, the two data sets have the same median, They also share the same first quartile score, so the second quartile range is the same. However, the overall range is not the same, nor is the interquartile range, since the first data set has a larger 3rd and fourth quartile range and a smaller first quartile range. The second data set has a much smaller range in the top 50%. There is no way of telling from the information given what the size of either data set was. Students who receive a four should discuss both known similarities and differences, as well as talking about what is not known. A student who earns a 3 should cover most if not all of the known similarities and differences, but will probably not discuss what is not known. A student who earns a 2 generally will only talk about one similarities and one difference, and not be comprehensive. A student who scores a one will only be able to identify one similarity OR one difference correctly and may make erroneous other observations about size of sample or information not known. A student who does not make any correct statements about similarities or differences would score a zero.

Examples of Student Work not available

Resources

- Copies of the "Box Whiskers" task sheet
- Writing utensil
- Calculators may be used
- Mathematics Rubric

Time Requirements

- One class period

NAME _____ DATE _____

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Student Task Sheet

The following two box and whiskers plots represent two different data sets. They have been placed appropriately above each other on the same scale. Based on the information provided in these two plots, describe how the data sets are similar and how they differ. Include as much detail as possible.