MEDIUMEST KID

Performance Standard 10 B.E

Make predictions about what the "mediumest" student in their grade level would be like (e.g., physical attributes, interests, family demographics), design a questionnaire to collect data, compile and display data, use conclusions drawn from the data to justify their description of the "mediumest" student:

- *Mathematical knowledge:* predict results, design a survey, gather, compile and display data;
- *Strategic knowledge:* make realistic predictions, design appropriate survey questions, create appropriate displays for the gathered data;
- *Explanation:* explain what was done and why the conclusions are accurate.

Procedures

1. ***In order to formulate questions, design data collection methods, gather and analyze data and communicate findings(10B)***, students should experience sufficient opportunities to develop the following:
   - Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.
2. In the novel Dear Mr. Henshaw by Beverly Cleary, the main character describes himself in a letter to his favorite author as "the mediumest kid" in the 6th grade. The teacher may want to get a copy of this book, find the passage and read it to the class. The teacher might ask what the character meant by being the mediumest kid. Begin a discussion about the concept of the mediumest kid. Create a list of the students' answers.
3. From the list have the students pick out what they think will be the most important attributes needed to describe the mediumest student in their grade level. Make a list of those attributes.
4. From that list have the students generate questions that could be put on a questionnaire/survey to be given to each student at their grade level. Either the teacher or one of the students needs to type the questions and then enough copies of the survey need to be duplicated for each student at your grade level. Students can work in partners, groups or individually depending on the size of your school to distribute the surveys, have them filled out and collected. Names should NOT be required on the survey sheets to eliminate possible embarrassment. (If this is being used by a class in a very large school where there are more than 60 students at a grade level, the teacher may want to limit the number of classes that fill out the survey.)
5. Data should be collected as a class with the teacher writing the data on the board or overhead and students copying it. After the data is copied, each student needs to arrange each data set in a meaningful way (e.g., line plot, stem and leaf plot, and least to greatest).
6. Each student will then need to make decisions about how to display the data and whether the mean, median, mode, range or percent gives the best descriptor of the mediumest kid. By now students should know the mean is not always the best descriptor of central tendency. For example, if one of the questions is about height, a very tall child or a very short child can influence the average height. It might be better to look at the median height knowing there are an equal number of students taller and shorter than the one in the middle.
7. Each student will then need to write a description of this imaginary mediumest student justifying each attribute with data collected. Make sure students understand they are NOT describing a real person in their school. The make-believe student they describe is a composite of all the data collected.
8. The teacher will need to monitor the types of questions the students want to put in the survey. Several physical attribute questions would be appropriate (e.g., height, eye color, hair color, size of shoes, male or female, ages). Other questions might be about favorites (color, book, sport, etc.). Sometimes questions about methods of getting to school (walk, ride the bus, parent brings, ride a bike) or where the students live (subdivisions, town, country, farm, etc.) are appropriate. Try to make sure questions will give a well-rounded picture of this imaginary student.
9. Look carefully at how the student arranged his/her data. Using a variety of techniques shows a deeper understanding than using the same technique over and over again.
10. The graphs need to be evaluated in terms of the data used. Bar graphs, circle graphs and pictographs will probably be the graphs that best match the data. Line graphs generally show change over time, and it is unlikely your survey will produce that kind of data. This is part of the assessment-whether a students knows what graph is appropriate to display what data.
11. The graphs need to be labeled appropriately with a title, each scale labeled, appropriate intervals, and a key if needed.

12. The written description should contain attributes of the imaginary student that match the data collected and can be justified by the data. For example a student might write, "The mediumest kid in 6th grade would be a boy because 58% of the students surveyed are boys. This boy would be 5 feet 1inch tall, which was the average height of 63 students surveyed. We didn't have any really tall or really short kids so the average is a good indicator of how tall this student might be. He would weigh about 100 pounds because 31 kids weighed more than that and 31 weighed less than that weight. I think this boy's weight might have been a little higher if we hadn't done boys and girls together. From the data, the boys tended to be the ones who weighed more than 100 pounds and the girls weighed less. I also think girls say they weigh less than they do." These observations show an understanding of data and its interpretation. The description would continue along these lines depending on the data you collected.

Examples of Student Work not available

Resources

- A chalkboard, white board, or overhead
- Typed and duplicated survey sheets
- Mathematics Rubric

Time Requirements

- One class period