

Exploring Data

Reporting Category Statistics

Topic mean absolute deviation, variance, standard deviation, and z-scores

Primary SOL A.9 The student, given a set of data, will interpret variation in real-world contexts and calculate and interpret mean absolute deviation, standard deviation, and z-scores.

Related SOL

Materials

- Graphing calculator
- Handouts
- Chart Paper or Overhead Transparencies for groups to record their information

Vocabulary

mean

dispersion, mean absolute deviation, standard deviation, variance, z-score (A.9)

Student/Teacher Actions – What should students be doing? What should teachers be doing to facilitate learning?

1. Explain to students that they will be collecting data of their own for this lesson. Each group will need to come up with an idea for data that they can collect from their classmates. The data should be numerical and should include a little variety. For example, student height in inches, average number of texts sent in one day, number of miles traveled from home to school, etc. If students come up with a data set that would yield a small range (ex. age of students in years) encourage them to seek data in a wider range (ex. age of students in months).
2. Allow groups some time to brainstorm ideas for data. Have each group fill out the top portion of the Data Collection sheet.
3. Have groups circulate the Data Collection sheets, so that each student records his/her information for each group.
4. Once all data has been collected, instruct the students to use their data to complete the Exploring Statistics Through Your Own Data sheet.
5. As students complete the Exploring Statistics Through Your Own Data sheet, provide each group with chart paper or an overhead transparency. Ask each group to display their histogram or line plot and their descriptive statistics. Be sure each group includes a title to their histogram or line plot, so the class will know what data they collected.
6. Hang the posters around the room and have students do a gallery walk (each group will visit each poster around the room for a minute or two). Start with one of the posters

and ask the class to make observations, inferences, and conclusions based on that group's data. Then have the group responsible for the poster share their own conclusions and questions. Repeat this for all groups. If you are using transparencies, show one group's transparency for a few minutes and allow the class to make observations, inferences, and conclusions. Then have the group responsible for the data share their conclusions and questions before posting the next transparency.

Assessment

- **Questions**
 - How does your graphical representation relate to the descriptive statistics you calculated?
- **Journal/writing prompts**
 - Explain what kind of information you can gain from exploring different descriptive statistics of a data set and how this information can help you draw conclusions about the data.
- **Other**
 - Point out an element on a line plot and ask students to estimate the z-score for that element.
 - Have students compare two of the data sets from the class. (Ex. What can you say about the number of texts we send in day compared to how long we talk on the phone?)

Extensions and Connections (for all students)

- Provide students with graphs and descriptive statistics from other classes and have them draw conclusions and raise questions about the data.

Strategies for Differentiation

- Some students may need poster paper with pre-drawn axes (histogram) or axis (line plot).
- Provide a straight edge and plenty of space to be creative.
- As students go on the gallery walk, some may need a graphic organizer to organize their thoughts. Provide a clip board for the ease of writing.

Exploring Statistics Through Your Own Data

6. What percent of the data lies outside of one standard deviation of the mean?

7. Choose two elements in your data set and calculate their associated z-scores.

element _____ z-score _____

element _____ z-score _____

8. What conclusions can you draw from the data you collected and the descriptive statistics you calculated? How did you make these conclusions?

9. What questions does your data raise? What other information or data might you collect to address these questions?