

## What Do Students Know about Variability?

Student understanding of variability in data is hierarchical. When looking at a collection of data, a student at a lower level might be concerned only with the extremes or only with the data in the center. A student at a higher level might begin to mention the data in the center as well as the outliers. At an even higher level, a student might recognize the connections between the data in the center and the variability of data dispersed around the center or point out deviations of data from some fixed value, such as the mean or median.

To promote this higher level of understanding about variability in data, students need time to be able to integrate the various aspects of a distribution—the center, the shape, and the spread—so that they are able to understand how each contributes to the whole. Research suggests that students' understanding of variability can develop over time *if* they are—

- given opportunities to explore data on a consistent basis;
- asked to attend to variability; and
- provided opportunities to develop and share their reasoning about sources of variation in data over time.

Based on *What Do We Know About Students' Thinking and Reasoning About Variability in Data?*

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