

The Common Core State Standards set ambitious goals for the development of middle school students' statistical thinking. In the present study, we contribute to the knowledge base about how these goals can be met. Specifically, we aimed to learn how students organize quantitative data, perceive aggregates, and discern typical values; we also sought to design an instructional sequence to help these statistical thinking processes develop. The study included four students entering sixth grade, two male and two female. We conducted pre-interviews to assess students' learning needs, taught seven weekly lessons, and administered a post-interview comprised of the same items as the pre-interview. Throughout the study, we used an iterative research cycle that involved gathering data on the students' mathematical understanding, qualitatively analyzing the data to identify the students' learning needs, designing a problem-based lesson to address the learning needs, trying the lesson with peers and faculty members, and making changes based on their feedback before lesson implementation. The first three lessons helped the students develop their skills of organizing and interpreting data. The fourth and fifth lessons assisted the students in discerning aggregate characteristics of distributions. The sixth and seventh lessons allowed the children to use the aggregate characteristics to make comparisons and predictions. During the study, the students took longer than expected to understand typical value as part of the central cluster. Our research suggests that students need to have sound knowledge of aggregate features of distributions before being introduced to formal measures of center like mean and median.