Sequence of activities to develop reasoning about variability.

Milestones: Ideas and Concepts	*Suggested Activities*
INFORMAL IDEAS PRIOR TO FORMAL STUDY OF VARIABILITY	
• Data vary. Values of a variable illustrate variability.	• Meet and Greet Activity (Lesson 1, Data Unit)
• Variability in results from a random experiment.	• Activities in Lessons 1 and 2, Statistical Models Unit)
• Informal idea of spread of data by examining a graph or comparing graphs.	• Distinguishing Distributions Activity (Lesson 1, Distributions Unit).
• Range as a simple measure of spread.	❖ An activity where students describe distribution and note range as a measure of spread. (The symbol ❖ indicates that this activity is not included in these lessons.)
FORMAL IDEAS OF VARIABILITY	
• Two ideas of variability: diversity or measurement error.	• How Big is Your Head Activity (Lesson 1: "Variation")
• Sources of variability, a lot and a little variability.	• How Big is Your Head Activity (Lesson 1)
• Averaging deviations from the mean as a measure of spread.	• Comparing Hand Spans Activity (Lesson 2: "Reasoning about the Standard Deviation")
• Standard deviation as a measure of average distance from the mean.	• Comparing Hand Spans Activity (Lesson 2)
• Understanding factors that cause the standard deviation to be larger or smaller.	• What Makes the Standard Deviation Larger or Smaller Activity (Lesson 2)
• How center and spread are represented in graphs?	❖ An activity where students match a set of graphs to the corresponding set of statistics.
BUILDING ON FORMAL IDEAS OF VARIABILITY IN SUBSEQUENT TOPICS	
• Range and IQR in a boxplot.	• How Many Raisins in a Box Activity (Lesson 1, Comparing Groups Unit)
• Variability within a group and variability between groups.	• Gummy Bears Activity (Lesson 2, Comparing Groups Unit)
• What makes the range and IQR larger and smaller?	• How do Students Spend their Time Activity (Lesson 4, Comparing Groups Unit)
• Understanding how and why center and spread are used to compare groups.	• How do Students Spend their Time Activity (Lesson 4, Comparing Groups Unit)
• Role of mean and standard deviation in describing location of values in a	• Activities in Lesson 3, Statistical Models Unit

normal distribution.	
• Understanding why and how variability decreases as sample size increases in sampling distributions.	• The Central Limit Theorem Activity, (Lesson 3, Samples and Sampling Unit)
• Understanding ideas of variability between and within groups when comparing samples of data.	• Gummy Bears Revisited Activity (Lesson 4, Statistical Inference Unit)
• Variability of data in a bivariate plot.	• Interpreting Scatterplots Activity (lesson 1, Covariation Unit)