Sequence of activities to develop reasoning about *data*.

Milestones: Ideas and Concepts	*Suggested Activities*
FORMAL IDEAS OF DATA	
• Data are values of a variable.	• Meet and Greet Activity (Lesson 1: "Data and Variability")
• Measurements produce data.	• Meet and Greet Activity (Lesson 1)
• Data show variability.	• Meet and Greet Activity (Lesson 1)
• Data are numbers with context.	• Variables on Back Activity (Lesson 1)
• There are different kinds of data.	• Meet and Greet Activity (Lesson 1)
• Some variability in data is due to measurement process.	• Meet and Greet, Variables on Back, and Developing a Class Survey Activities (Lesson 1)
• Importance of taking good measurements by asking clear questions.	• Developing a Class Survey Activity (Lesson 1)
• It is important to look at multiple variables (Multivariate data) to better understand and describe a group.	• Developing a Class Survey Activity (Lesson 1)
• Sources of bias in questions.	• How you Ask a Question Activity (Lesson 2: "Avoiding Bias")
• Importance of asking clear, unambiguous questions in collection survey data.	• Critiquing the Student Survey Activity (Lesson 2)
• Idea, purpose and importance of random sampling.	• The *Gettysburg Address* Activity (Lesson 3: "Random Sampling")
• Different methods and reasons to take samples.	• Student Survey Sampling Activity (Lesson 3)
• Purpose of experiments to produce data to determine cause and effect.	• Taste Test Activity (Lesson 4: "Randomized Experiments")
• Purpose of randomization in an experiment.	• Taste Test Activity (Lesson 4)
• Idea of making an inference based on a result of an experiment (using simulation).	• Taste Test Activity (Lesson 4)
• Importance of randomization in drawing inferences about results of an experiment.	❖ Activity involving random assignment, with introduction to permutation test to informally test if results of the experiment are surprising or due to chance. (The symbol ❖ indicates that this activity is not included in these lessons.)
• Importance of knowing sources of data: data coming from samples or from experiments.	❖ Activity where students identify whether the research is a survey (observational data) or an experiment.

• Good data vs. bad data.	❖ Activity where students identify potential sources of bias or confounding.
• What type of conclusions can be drawn based on the type of data.	❖ Activity identifying the type of conclusion given a study description.
• What kinds of questions to ask about where data come from.	❖ Activity where students ask appropriate questions for given sets of data.
BUILDING ON FORMAL IDEAS OF DATA IN SUBSEQUENT TOPICS	
• Two sources of variation in measurement data.	• How Big is Your Head Activity (Lesson 1 in the Variability Unit)
• Reducing variability in measurement data.	• Gummy Bears Activity (Lesson 2 in the Comparing Groups Unit)
• Determining cause and effect from an experiment.	• Gummy Bears Revisited Activity (Lesson 4 in the Statistical Inference Unit)
• Correlation does not imply causation.	• Credit Questions Activity (Lesson 1 in the Covariation Unit)