

Please attach this sheet to the front of your assignment

**Procedures and instructions are supplied separately.**

Team 1: measured  $\frac{1}{2}$  cup of pasta shells - using opaque measuring  $\frac{1}{2}$ -cup

Team 2: measured  $\frac{1}{2}$  cup of pasta shells - using transparent large measuring cup

$$\text{Standard Error} = \frac{s}{\sqrt{n}} \quad \text{Error boundaries at } \bar{x} \pm \text{standard error}$$

Where  $\bar{x}$  = mean of means,  $s$  = standard deviation of means and  $n$  = sample size (5).

**Write Up**

1. How many sample means for each team fall outside these boundaries? Which method is better? Describe what common error boundaries tell you about the two methods.
2. What do these stem & leaf plots indicate about the variation within each group and between groups? Do both processes vary by about the same amount? How do you know? Are there differences in the patterns of variation? Describe them.
3. Identify the data values that indicate different sources of variation. Which would you consider common cause variation and which special case variation (if they exist)? Explain why you think this.
4. Which of these two methods would you recommend and why? Back up your recommendation with evidence from the above analysis. Be specific.

**Grading**

Use appropriate vocabulary.

Demonstrate that you understand what center, variation, and the standard error tell you about the distribution of values and the differences in the two methods of measuring, in this case, pasta.

Show that you are thinking about common and special causes of variation, how they show up in the plots, and what this might tell you about the two methods used to measure.

Back your reasoning with specific examples from the data and plots.

Link your analysis to the real world.