

Improving Reading Ability

An educator conducted an experiment to test whether new directed reading activities in the classroom will help elementary school pupils improve some aspects of their reading ability. She arranged for a third grade class of 21 students to follow these activities for an 8-week period. A control classroom of 23 third graders followed the same curriculum without the activities. At the end of the 8 weeks, all students took a Degree of Reading Power (DRP) test, which measures the aspects of reading ability that the treatment is designed to improve.

The Data:

Control:

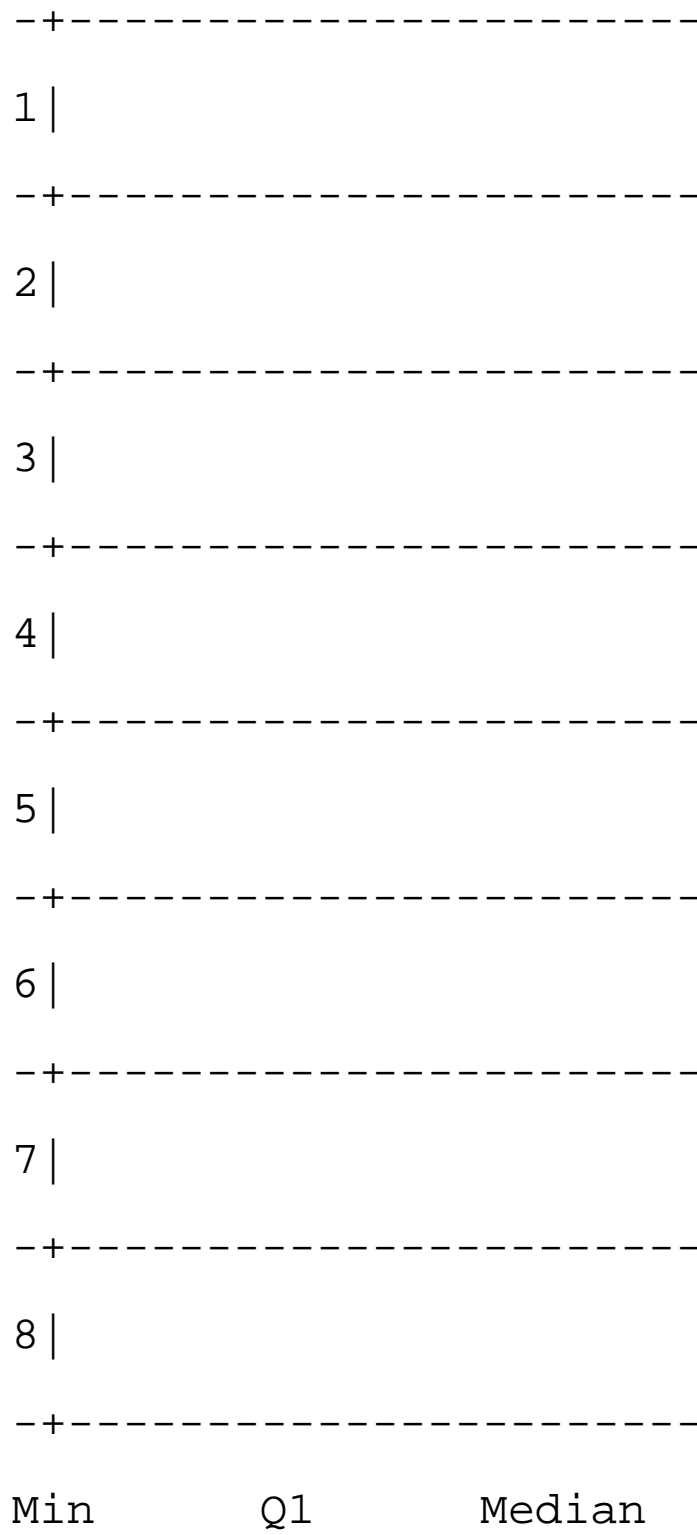
42 43 55 26 62 37 33 41 19 54 20 85
46 10 17 60 53 42 37 42 55 28 48

Treated:

24 43 58 80 43 49 61 44 67 49 53 56
59 52 62 54 57 33 46 43 57

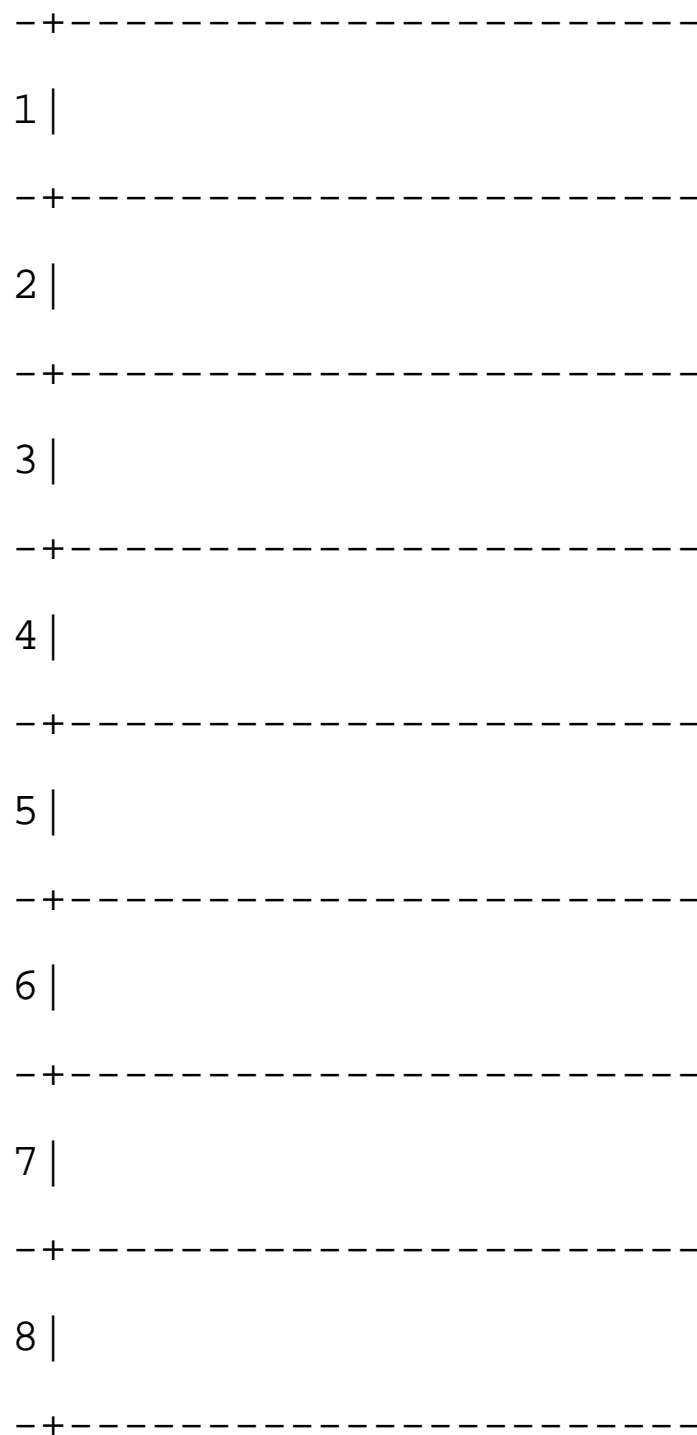
Control: Stem and Leaf Plot

Boxplot



Treated: Stem and Leaf Plot

Boxplot



Min Q1 Median Q3 Max

What Does a Statistician Do?

- *Design* good studies (experiment, survey, review of existing data)
- *Explore* data in the studies
- *Estimate* unknown quantities measured by the data
- *Test* hypotheses about how data were generated

With What Tools?

- *Assumptions* or Models about how the data were generated
- *Methods* for dealing with unusual observations
- *Samples* from populations
- *Probability* to characterize randomness
- *Measures of Center* to characterize regularity
- *Measures of Spread* to gauge comparisons of different samples

Recurring Themes in the Course

- Randomness and Regularity; Summarizing the Center
- Variability and Spread; Yardstick for Comparison
- Sampling; Generalizing to a Population
- Study Design; Did my Manipulation Cause This?