

Don't Spill the Beans!

Utah Secondary Mathematics Core Curriculum Standards

displaying data, collecting and interpreting data, comparing results and displays

GAISE Guidelines for Assessment and Instruction in Statistics Education

Level B Understanding – formulate questions, collect data, analyze data, and interpret the results

Teacher generated question – What is an informative way to display these data?

Student generated questions – Which hand has more capacity, one's dominant hand or one's non-dominant hand?

Learning Outcomes

- Students become interested in statistics
- Students understand how to collect and interpret statistical information
- Students create and conduct a statistical investigation

Specific Skills

- Students formulate questions
- Students collect and record data
- Students chart results and use descriptive statistics
- Students analyze results

Materials Needed

- A large container of dried beans
- Large measuring cup with milliliters
- A coin
- Stopwatch

Directions

Begin by asking the students to make hypotheses about which hand (dominant or non-dominant) can hold more beans. Guide them in setting up an experiment to test their hypothesis. Decide as a class the procedures for the experiment considering, for example, hand position, distances to transport the beans, etc. Emphasize that they are not competing with each other, but comparing each student's two hands. Have each student flip a coin to decide which hand should be used first. Appoint one person to be the timer. When the timer starts the stopwatch, a student takes fistfuls of beans and puts them into another container. After three seconds, the student stops and measures the volume of beans he or she was able to transfer. Use milliliters. Record which hand was used and whether it was the dominant or non-dominant hand. Use the results to make boxplots to compare dominant and non-dominant hands. Examine the boxplots and discuss what information they give. Then calculate the differences in the counts for dominant hand minus non-dominant hand count for each student. Make a boxplot of the differences. Examine boxplot and discuss what information it gives.

Student	Dominant Hand	Non-Dominant Hand	Difference
<i>Todd</i>	230	205	25
<i>Jordan</i>	166	136	30
<i>Erin</i>	179	118	61
<i>Jessica</i>	150	150	0
<i>Matt</i>	179	193	-14
<i>Bethany</i>	234	170	64
<i>McKensie</i>	172	141	31
<i>Brandon</i>	142	122	20
<i>Stephanie</i>	152	142	10
<i>Ashley</i>	154	123	31
<i>Kendra</i>	204	206	-2
<i>Sam</i>	179	136	43
<i>Lisa</i>	212	200	12

Prompt the students to generate and answer data analysis questions.

What different information do the boxplots provide?

How can each graph be used to answer the research question?

Do the boxplots provide evidence in support of our hypothesis?

How can this be seen?

What surprised you about the results?

