

Colors Challenge

Utah Secondary Mathematics Core Curriculum Standards

Comparing experimental results with theoretical probability, comparing results of probability experiments, displaying data, proposing and justifying inferences and predictions based on data, collecting and interpreting data

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 – Is the ability to name colors challenged when displayed with the name of another color?

Student generated questions – What are the mean response times reading colors in two ways?

Learning Outcomes

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

Specific Skills

- Students collect and record data
- Students analyze results
- Students compare responses

Materials Needed

- Cards with color words written in black ink
- Cards with color words written with non-matching colored ink
- Stopwatches (one per group)

Directions

Explain that a psychology researcher wanted to know how people react when two conflicting stimulations are presented to them. In his research, he experimented by asking people to say the color of ink used to print the name of colors. He found that people have a tendency to read the text and have difficulty ignoring the word itself to say the color. Plan an experiment with the class and divide them into groups. Give each group two sets of 12 cards (like “flash cards”) – one set with the names of colors printed with black ink and the other set with names of colors printed in non-matching colored ink. To randomize the process, have the students shuffle the cards between tests and randomize (with a coin toss) the sequence of reading each set of cards. Also, help them establish a procedure so that the measurements are independent, i.e., one person’s response does not condition the next person’s response. Have them measure response times for reading color words in black ink and then naming the color of the ink for the color names when printed in a non-matching color ink. Discuss ways of comparing and presenting the data.

Examples

Card with color name written in black ink:



Card with color name written in non-matching colored ink:



Use these colors: Blue, Brown, Green, Orange, Pink, Purple

Our Class Results: Response Times (seconds)

| | <i>Black Ink</i> | <i>Colored Ink</i> |
|----------------|------------------|--------------------|
| Amber | 4.96 | 5.75 |
| Jack | 6.23 | 6.90 |
| Aaron | 6.78 | 8.62 |
| Julie | 5.90 | 8.90 |
| Jessica | 5.88 | 9.41 |
| Nick | 6.10 | 10.00 |
| Byron | 4.46 | 6.81 |

Prompt the students to generate and answer data analysis questions.

What are the mean response times for each card type?

Construct comparative boxplots of the two ways of reading the cards.

Are the results in our class consistent with the results reported by the psychology researcher? How or how not?

