

Step 1: Define your variables

Research Question:

Does regular chess playing improve the memory quality of 8th year Ironbard students?

Variables	Description
Student Name	Qualitative Categorical, (will be replaced with a unique ID for Masking)
Memory Test	Quantitative, Discrete, (1-10)
Play Chess as Black	Discrete Ordinal Variable, (-1,0,1) (loss, tie, win)
Play Chess as White	Discrete Ordinal Variable, (-1,0,1) (loss, tie, win)
Date	Our World Date

Confounding Variables	How to control
Demographic advantages	Select students from multiple schools from across the Island

Expecting to see an increase of average memory test scores from students as the experiment develops.

Step 2: Write your hypothesis (We will skip it for now)

Regular chess playing significantly improves memory scores in 8th-year students compared to those who do not play chess.

Step 3: Design your experimental treatments

Variables	Description
Memory Test	Dependent
Play Chess as Black	Independent
Play Chess as White	Independent

(Will probably combine White and black after experiment to have one independent Variable)

Step 4: Assign your subjects to treatment groups

Sample Size - Cochran's sample size formula

Confidence Level:	0.90
Margin of Error (e)	0.05
Population Proportion (p):	0.5
Initial Sample Size (n_0):	270.6
Total Population (N):	145
Adjusted Sample Size (n):	95

Initially, I planned to divide 95 students across three major cities, with approximately 32 students at each school. This would result in 16 pairs of students playing two games each day—one as black, one as white.

However, due to the limitations of the island, I will randomly select two students from each school, resulting in a total of 6 students. These students will play two games of chess per day, one as white and one as black over the fall season (September 15th - 21st). After each game, they will take a memory test that scores between 1 and 10. I will track these scores to observe any significant improvements in memory throughout the season.

Additionally, two randomly selected students from each school will serve as a control group. They will complete the daily memory test but will not play chess. In total, 12 students will participate in the experiment.

Step 5: Measure your dependent variable

I will gather data into a spreadsheet during the testing phase. After the experiment I will clean and format the data and analyze it in R.