

Cross-Curricular Connections: Q

Directions: Define key science terms relating to topics in social science, experimental design and math/statistics using contextual clues from "[Replication crisis spurs reforms.](#)" Consult an outside resource if necessary.

Word bank and definitions by science subtopic:

Social science

What is social science?

What is psychology?

What is economics?

Experimental design

What is experimental design?

What is a hypothesis?

What is a control?

What is data analysis?

What is reproducibility or replication?

Math and statistics

What is statistics?

What is a null hypothesis?

What is statistical significance?

What is the p value?

What is the mean?

What is standard deviation?

What are error bars?

What is curve fitting?

Discussion beyond the article: Dig deeper into the methodology of experimental design. Can you create your own study and reproduce the results after you answer these questions?

How many samples are needed to test a hypothesis?

What is the sample size of an experiment?

What are the consequences of not having a large enough sample size?

What are potential consequences of having too big a sample size?

Once a sample size is determined, how does a scientist choose which individuals to include in a study or experiment?

What is the number of trials in an experiment?

Additional activities: To gain a better understanding of some of the concepts discussed above, you could design experiments and analyze data based on experiments outlined in previous Educator Guides.

Here are the links to two previous Educator Guides that will walk you through the process of designing an experiment.

1. **Cookieology:** Explore the steps of experimental design and learn about food science, while attempting to create the ideal cookie. And, once it's created can you reproduce it? Can your classmates?
2. **Animal Math:** Design a study to test others' number sense, or sense of quantities.