Now it's time to flex your critical evaluation skills. Read the following descriptions of an experiment and its analysis, identify the flaws in each, and describe what you would do to correct them.

1. The Sith Lords are concerned that their recruiting slogan, "Give In to Your Anger," isn't very effective. Darth Vader develops an alternative slogan, "Together We Can Rule the Galaxy." They compare the slogans on two groups of 50 captured droids each. In one group, Emperor Palpatine delivers the "Anger" slogan. In the other, Darth Vader presents the "Together" slogan. 20 droids convert to the Dark Side after hearing Palpatine's slogan, while only 5 droids convert after hearing Vader's. The Sith's data scientist concludes that "Anger" is a more effective slogan and should continue to be used.

Problem one the population being tested may not be representative of the population the slogan is intended for, because the driods may be biased due to their captivity, however, kudos for uniform experimental and control populations. Problem two is that there is likely influence on the population from the presenter Vader may sound more authoritative with his voice or Palpatine may be using Jedi mind tricks on the droids

A much better test could be designed by using text variations of the slogans and spreading them around a uniform selection of planetary systems. Sucess could then be measured by the recruiting success in populations exposed to various slogans. This would avoid bias populations and perceptual differences between the person delivering the slogan.

1. In the past, the Jedi have had difficulty with public relations. They send two envoys, Jar Jar Binks and Mace Windu, to four friendly and four unfriendly planets respectively, with the goal of promoting favorable feelings toward the Jedi. Upon their return, the envoys learn that Jar Jar was much more effective than Windu: Over 75% of the people surveyed said their attitudes had become more favorable after speaking with Jar Jar, while only 65% said their attitudes had become more favorable after speaking with Windu. This makes Windu angry, because he is sure that he had a better success rate than Jar Jar on every planet. The Jedi choose Jar Jar to be their representative in the future.

Problem one Jar Jar Binks visited the friendly planets while Windu visited the unfriendly planets. So the populations being tested where not uniform. This likely made Windu’s job more difficult in that he had to convince more people to change their attitudes.

Problem two, mace Windu is a Jedi it is possible that Windu was viewed as having a conflict of interest bias where Jar Jar is not a Jedi and is likely viewed with having less of a conflict of interest.

This could have been resolved by sending both Windu and Jar Jar to two friends and to unfriendly planets each. This would make each population more uniform it would be helpful to have a survey of the planets before the two visit them to have a before and after comparison.

1. A company with work sites in five different countries has sent you data on employee satisfaction rates for workers in Human Resources and workers in Information Technology. Most HR workers are concentrated in three of the countries, while IT workers are equally distributed across worksites. The company requests a report on satisfaction for each job type. You calculate average job satisfaction for HR and for IT and present the report.

Job sentiments can vary extensively between countries it would be best to show averages of HR workers to IT workers in the same country.

1. When people install the Happy Days Fitness Tracker app, they are asked to "opt in" to a data collection scheme where their level of physical activity data is automatically sent to the company for product research purposes. During your interview with the company, they tell you that the app is very effective because after installing the app, the data show that people's activity levels rise steadily.

Problem one people who download a fitness app likely have the intention of exercising and becoming more fit biasing the data coming into the system. Problem two is that people willing to submit data regarding their fitness might likely be fit or feel more confident about their ability to become fit.

This could be resolved by comparing the fitness tracker to alternatives such as gym membership and seeing how it compares to competitors.

1. To prevent cheating, a teacher writes three versions of a test. She stacks the three versions together, first all copies of Version A, then all copies of Version B, then all copies of Version C. As students arrive for the exam, each student takes a test. When grading the test, the teacher finds that students who took Version B scored higher than students who took either Version A or Version C. She concludes from this that Version B is easier, and discards it.

Problem one the tests where not randomized and the populations of students for each test where likely non-uniform. The students in group B might be better students. This could have been mitigated by creating populations based on grades and pulling an equal number from each to take the various test versions