

Info Gap: Is There a Difference?

### Problem Card 1

Some students claim that listening to their favorite song before a test improves their score.

12 students offer to test the hypothesis by first dividing into 2 groups at random. One group will listen to their favorite song before taking a standardized test and the other group will take the standardized test without listening to music before the test.

The scores from the standardized test are collected and analyzed. Does listening to music affect the outcomes for the standardized test?

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### Data Card 1

- The mean score for the group that listened to their favorite song is 1,082.16.
- The mean score for the group that did not listen to music is 996.33.
- The difference in mean scores for the two original groupings is 85.83.
- 100 trials are run in which the data are randomly assigned to 2 groups.
- 27 trials have a difference in means of at least 85.83.
- 38 trials have a difference in means of less than -85.83.

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### Problem Card 2

Medical professionals are studying a new type of antidepressant that is meant to reduce the length of time needed to feel the effects.

20 people suffering from diagnosed depression are split into 2 groups at random. One group is given the current popular medication and the second group given the new antidepressant. Participants in the study are asked to report how long it takes until they notice a lasting change in their mood.

The professionals want to know which antidepressant is better to prescribe to patients. Is one medication better than the other?

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### Data Card 2

- The mean for the popular antidepressant is 8.9 weeks.
- The mean for the new antidepressant is 4.6 weeks.
- The difference in mean times for the original groupings is 4.3 weeks.
- 100 trials are run in which the data are randomly assigned to 2 groups.
- The difference in means for the randomized groups is approximately normally distributed.
- The mean difference in means for the two randomized groups is 0.05 weeks.
- The standard deviation of the difference in means for the two randomized groups is 1.14 weeks.