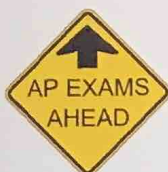


Lesson 3: Is one form of the AP exam harder?



Last year, East Kentwood High School had 30 students take the AP Statistics exam. We were informed later that the College Board gave two forms of the exam, which were randomly assigned to the students. Here are the results:

Form A	3	3	3	3	4	4	4	4	5	5	5	5	5	5	5
Form B	2	2	3	3	4	4	4	4	4	5	5	5	5	5	5

Mean score Form A (\bar{x}_A)? 4.20 Mean score Form B (\bar{x}_B)? 4.00

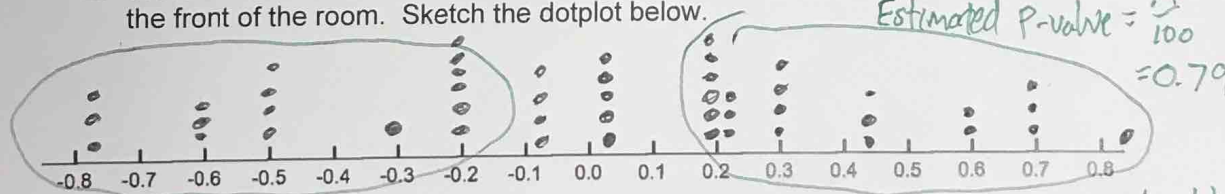
What is the difference in means $\bar{x}_A - \bar{x}_B$? $4.20 - 4.00 = 0.20$

Assume the two forms are the same difficulty, so if Doug scored a 5 on Form A, he would also score a 5 on Form B. In other words, Doug is a 5 no matter which form he is randomly assigned.

- The 30 AP scores from the class are written on 30 cards. Randomly assign half of the students to get Form A and the other half to get Form B. What is the difference in mean scores for this random assignment?

$\bar{x}_A =$ 3.95 $\bar{x}_B =$ 4.25 $\bar{x}_A - \bar{x}_B =$ -0.30

- Write the difference of mean scores on a sticker dot and take it to the poster at the front of the room. Sketch the dotplot below.



difference of mean scores ($\bar{x}_A - \bar{x}_B$) Extend simulation www.stapplet.com
"One Quantitative Variable"

- East Kentwood had a difference of mean scores of $4.20 - 4.0 = 0.2$. Is this outcome surprising if we assume both forms are the same difficulty? Explain.

No! Assuming both forms are the same difficulty, there is about a 79% probability of a difference of average scores of 0.2 or greater purely by chance.

- Based on the simulation, do we have convincing evidence that one form of the exam is harder? Explain.

No! Because this result is NOT surprising (more than 5%) we do NOT have convincing evidence that one form of the AP Exam was harder.