

Rubric – Target vs No Target

Solution

- a. Ideally the group sizes should be 14 each. One possible random assignment is to write every student's name on a slip of paper, place the slips of paper in a bowl, mix the slips well, then draw out names one at a time. The first name is assigned to one of the groups. The second name is assigned to the other group. Assignment continues to alternate until all names are assigned to a group.
- b. The Target group has a slightly larger spread (110 to 190) than the No Target group (125 to 200). However, the middle 50% of the distribution for the Target group (150 to 167) is less variable than the No Target group (152 to 180). The median for the No Target group is about 11 cm higher than the Target group. About 50% of the No Target group jumped at least 168 cm compared to the Target group where 50% jumped at least 157 cm. The distribution of the No Target groups is roughly symmetric whereas the distribution of the Target group is slightly skewed to the left.
- c. The minimum, first quartile, median, third quartile and maximum are all larger for the no target group. Notice that approximately half of the No Target group jumped farther than 75% of the Target group. Overall, it appears from the side-by-side boxplots that students jump farther if they are not given a target.

Scoring

Each part is scored as Essentially Correct (E), Partially Correct (P), or Incorrect (I).

Part (a) is scored Essentially Correct (E), Partially Correct (P), or Incorrect.

Essentially correct if the response contains a detailed description using randomization that you could implement. Note that unequal group sizes are acceptable. Other methods of randomization are acceptable (such as using a random number generator or flipping coins) if correctly described.

Partially correct if the groups are formed using randomization, but the description is not detailed enough to implement. For example, flip a coin for each student to decide whether or not to use a target.

Incorrect if the formation of the groups does not rely on randomization.

Part (b) is scored Essentially Correct (E), Partially Correct (P), or Incorrect.

Essentially correct if the response includes comparative statements about the centers, shapes, and the amounts of variability in the two distributions.

Partially correct if the response includes two of the three comparative statements about the distributions.

Incorrect if the response does not include comparative statements.

Part (c) is scored Essentially Correct (E), Partially Correct (P), or Incorrect.

Essentially correct if the response includes a decision (yes or no decision can be made because of overlap) and a solid justification.

Partially correct if the justification is weak or decision is not made.

4 Complete Response

All three parts essentially correct

3 Substantial Response

Two parts essentially correct and one part partially correct

2 Developing Response

Two parts essentially correct and one part incorrect

OR

One part essentially correct and one or two parts partially correct

OR

Three parts partially correct

1 Minimal Response

One part essentially correct and two parts incorrect

OR

Two parts partially correct and one part incorrect