

Correlation Playground Challenges

Below I provide a few different challenges to help deepen your understanding of **correlation**. Use the [Correlation Scratchpad](#).

Using the Playgrounds

The activities for this scratchpad are organized around the **POE principal**. First **predict**, then **observe**, and finally, **explain**.

The purpose of the predict step is that you write down your predictions before entering data for a particular exercise. This step is extremely important: I do not want to encourage people to mindlessly input numbers until a correct solution is reached. Instead, I want to encourage you to actively think about the questions and make your best educated guess before starting to enter data. Observing the results of data entered based on your well thought out prediction builds a better stage for understanding where and when you have misconceptions.

More importantly, students should view using the Statistical Scratchpads as an iterative process. This means that you will enter some data, receive feedback, and then you can revise your data as often as necessary to meet the conditions stated in a particular problem. If your observation is very different from what you predicted, then you will have an important basis for re-evaluating and re-conceptualizing where and why your prediction was off base. The final step is to explain either the similarities between your prediction and subsequent observation OR to explain the dissimilarities.

The Activities

For the correlation challenges we will use two variables. First is a measure of how much someone “likes” biology. Second is a measure of biology achievement. You have 6 subjects. The “like” variable is measured on a 0 to 10 scale. The “achievement” variable is measured on a 0 to 100 scale.

Use a blank piece of paper to write down a set of scores that you think might work based on your prediction. When you are happy with a draft set of scores, then enter them into either the web-based [Inference Tests Scratchpad](#).

Correlation Challenges

You'll find the scratchpad at this link: [Correlation Scratchpad](#).

Challenge 1

Create a situation where there is a perfect negative correlation between the two variables. In this case the perfect value you are trying to create is $r = -1.0$.

1. **Predict:** Write a set of numbers that you think will generate this result.
2. **Observe:** Now put your numbers into the scratchpad. What do you observe?
3. **Explain:** Compare your predictions and observations. Explain the results.

Challenge 2

Create a situation where there is a moderate positive correlation between the two variables. You are trying to create a correlation **between .50 and .69**.

1. **Predict:** Write a set of numbers that you think will generate this result.
2. **Observe:** Now put your numbers into the scratchpad. What do you observe?
3. **Explain:** Compare your predictions and observations. Explain the results.

Challenge 3

Create a situation where there is an inconsequential correlation between the two variables. You are trying to create a correlation **between -0.19 and +0.19**.

1. **Predict:** Write a set of numbers that you think will generate this result.
2. **Observe:** Now put your numbers into the scratchpad. What do you observe?
3. **Explain:** Compare your predictions and observations. Explain the results.

Challenge 4

Create a situation where there is a small positive correlation between the two variables. You are trying to create a correlation **between +.20 and +.49**.

1. **Predict:** Write a set of numbers that you think will generate this result.
2. **Observe:** Now put your numbers into the scratchpad. What do you observe?
3. **Explain:** Compare your predictions and observations. Explain the results.