Is Yawning Contagious? Big idea: is there an association between two variables? An experiment conducted by MythBusters tested if a person can be subconsciously influenced into yawning if another person near them yawns.

In this study 50 people were randomly assigned to two groups: 34 to a group where a person near them yawned (`seeded = 1`) and 16 to a control group where there wasn't a yawn seed (`seeded = 0`). They then recorded the whether each subject yawned (`yawned = 1`) or not (`yawned = 0`). The results are as follows:

```
##       yawned
## seeded  0  1
##      0 12  4
##      1 24 10
```

1. What is the explanatory variable? Response variable?

2. What is the probability of yawning, for the seeded group?

3. What is the probability of yawning, for the unseeded group?

4. If there were *no association* between yawning and the proximity of another yawner, what would you expect the difference to be between these two probabilities?

5. Let X be the number of people in the unseeded group that yawned. What are the possible values that X can take?

6. In terms of X, what is an example of a result that would demonstrate a *strong* association between yawning and being exposed to a yawn? $X =$

Simulating Yawners What kind of data would be observed if there was no association between these variables and if the only variation was caused by the process of randomly assigning subjects to the two conditions? Find out by *simulating* the process.

1. Create a deck of cards, 36 of which represent subjects who did not yawn, 14 of which represent subjects who yawned.
2. Shuffle the deck of cards to simulate the process of randomly assignment to the two conditions: being exposed to a yawn (seeded) and not being exposed (unseeded).
3. Deal them into two decks of size 16 and 34, representing the 1/3 of the subjects that were assigned to the seeded group and the 2/3 assigned to the unseeded group.
4. Count the number of yawners that happened to end up in the seeded group just by chance and record your count below as x_1.
5. Repeat process 5 more times.

x_1	x_2	x_3	x_4	x_5	x_6

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1. How many yawners would you expect to find in the seeded group just by chance? (i.e. what is $E(X)$?)

2. What value of X did the MythBusters actually observe?

3. How would we summarize these results? What is the big idea?