

Name: _____ Hour: _____ Date: _____

Is Yawning Contagious?



Mythbusters investigated this question. Here's a brief recap. Each subject was placed in a booth for an extended period of time and monitored by hidden camera. 34 subjects were given a "yawn seed" by one of the experimenters: that is, the experimenter yawned in the subject's presence before leaving the room. The remaining 16 subjects were given no yawn seed.

1. Draw an outline of *Mythbuster's* experiment.

50 subjects

2. Here are the Mythbusters results.

Yawn seed?	Subject Yawned?		Total
	Yes	No	
Yes	10	24	34
No	4	12	16
Total	14	36	50

Call p_1 the true proportion of yes yawn seed people who yawn. $\hat{p}_1 =$ _____

Call p_2 the true proportion of no yawn seed people who yawn. $\hat{p}_2 =$ _____

What is the difference in proportions $\hat{p}_1 - \hat{p}_2$? _____

3. Do the data provide *some* evidence that yawning is contagious? Why?

4. Adam Savage and Jamie Hyneman, the cohosts of *Mythbusters* used these data to conclude that yawning is contagious. Do you agree?

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In this Activity, your class will investigate whether the results of the experiment are statistically significant OR if they could have occurred purely by chance due to random assignment.

4. What is the null hypothesis?

The 50 people in the experiment are represented by the cards. A person is either a yawner or a non-yawner, no matter which treatment they are randomly assigned.

5. Shuffle the 50 cards and put them into two piles, one group of 34 that gets the yawn seed and one group of 16 that does not get the yawn seed. Record the proportion of people who yawned in each group. You will do this three times.

Trial	Proportion who yawned in yawn seed group, \hat{p}_1	Proportion who yawned no yawn seed group, \hat{p}_2	Difference in proportions, $\hat{p}_1 - \hat{p}_2$
1			
2			
3			

6. Make a class dotplot of the [difference in proportions](#). Sketch below:

7. In what percent of the class's trials did the difference in proportions equal or exceed 29% - 25% = 4% (what *Mythbusters* got in their experiment)?

8. What conclusion can you make about whether yawning is contagious?

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Tests About a Difference in Proportions - Intro

Important ideas:

Check Your Understanding

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Complete the first two steps of a significance test.

STATE: Parameter:

Statistic:

Hypotheses:

Significance level:

PLAN: Name of procedure:

Check conditions: