Name: _____ Hour: _____ Date: _____

Are Taco Tongue and Evil Eyebrow independent?

Is there an association between the Taco Tongue and the Evil Eyebrow? Below is the data for a random sample of 600 Senior students. Do we have convincing evidence that the ability to do the Taco Tongue and Evil Eyebrow are associated for all Seniors?

1. Describe what it means for two events to be independent.

2. Calculate the expected counts.

Observed:

	Yes Evil Eyebrow	No Evil Eyebrow	Total
Yes Taco Tongue	180	300	480
No Taco Tongue	20	100	120
Total	200	400	600

Expected:

	Yes Evil Eyebrow	No Evil Eyebrow	Total
Yes Taco Tongue			480
No Taco Tongue			120
Total	200	400	600

3. Do the data provide significant evidence that there is an association between the ability to Taco Tongue and Evil Eyebrow for all Seniors? Use $\alpha = 0.05$

STATE: Hypotheses: Significance level:

PLAN: Name of procedure: **chi-square test for independence**

Check conditions:

DO: Specific Formula:

Work: Picture:

Test statistic:

P-value:

CONCLUDE:

STATS MEDIC

Name: _____ Hour: _____ Date: _____

Chi-Square Test for Independence

Important ideas:

Check Your Understanding

For each of the following situations decide what type of chi square test is appropriate. Explain.

1. A random sample of 200 students was asked to sample a new type of pizza that the school was considering using as a replacement for the current pizza. Each student stated if they were a freshman, sophomore, junior, or senior and also if they liked the new pizza more than the current pizza (or not). The school would like to know if there is a relationship between grade level and pizza opinion.

2. Another school is also considering changing their pizza vendor. This school selects separate random samples of 50 freshmen, 50 sophomores, 50 juniors, and 50 seniors. Each student tries the new pizza and states whether they like it more than the current pizza (or not). The school would like to know if the distribution of opinion differs across the grade levels.

3. A pizza shop claims that 30% of orders are placed on Fridays, 20% are placed on Saturdays, and 10% of orders are placed on the other days of the week. A global pandemic may have changed this distribution. The manager investigates so he knows how to staff the pizza shop appropriately. He selects a random sample of 300 orders and classifies each one according to the day of the week the order was placed. He wants to know if the distribution of orders is the same as it was before the global pandemic.