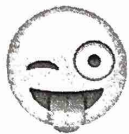
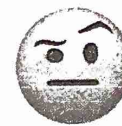


Name: _____ Hour: _____ Date: _____



Can You Taco Tongue and Evil Eyebrow?



Some people believe that the ability to taco tongue and evil eyebrow is something that you are born with. Is this true? Are the two abilities somehow related?

1. Collect class data to fill in the following two-way table.

		Evil Eyebrow			Totals
		No	Sort of	Yes	
Taco Tongue	Yes	5	8	7	20
	No	7	2	1	10
Totals		12	10	8	30

2. Suppose that we randomly choose a student from class. Find the following probabilities.

$$P(\text{No Evil Eyebrow}) = \frac{12}{30}$$

$$P(\text{Sort of Evil Eyebrow}) = \frac{10}{30}$$

$$P(\text{No Evil Eyebrow OR Sort of Evil Eyebrow}) = \frac{12}{30} + \frac{10}{30} = \frac{22}{30}$$

Mutually Exclusive

3. Suppose that we randomly choose a student from class. Find the following probabilities.

$$P(\text{Yes Taco Tongue}) = \frac{20}{30}$$

$$P(\text{Yes Evil Eyebrow}) = \frac{8}{30}$$

$$P(\text{Yes Taco Tongue OR Yes Evil Eyebrow}) = \frac{20}{30} + \frac{8}{30} - \frac{7}{30} = \frac{21}{30}$$

Not mutually exclusive

4. Suppose that we randomly choose a student from class. Find the following probabilities.

$$P(\text{Yes Evil Eyebrow}) = \frac{8}{30}$$

$$P(\text{Yes Evil Eyebrow, given the person is Yes Taco Tongue}) = \frac{7}{20}$$

$$P(\text{Yes Evil Eyebrow, given the person is No Taco Tongue}) = \frac{1}{10}$$

Conditional Probability

5. What do your results from #4 tell you about the ability to Taco Tongue and the ability to Evil Eyebrow?

If a person can do the Taco Tongue, they are more likely to be able to Evil Eyebrow than if they couldn't Taco Tongue. +

Lesson 8.3 – Two-Way Tables and Conditional Probability

<p>Important ideas:</p> <p><u>LT #1</u></p> <p>Mutually exclusive events cannot occur at same time.</p> <p>Ex. blue eyes brown eyes</p>	<p><u>LT #2</u></p> <p style="text-align: right;">0 if events are mutually exclusive ↓</p> <p>$P(A \text{ OR } B) = P(A) + P(B) - P(A \text{ AND } B)$</p> <hr/> <p><u>LT #3</u></p> <p>Conditional probability → cover up the parts of the table you don't need</p>
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Check Your Understanding

A national survey was taken measuring the highest level of educational achievement among adults age 30 and over.

Highest level of education	Women	Men	Total
8th grade or less	35	46	81
High school graduate	232	305	537
Some college	419	374	793
Bachelor's degree	539	463	1002
Graduate or professional degree	377	382	759
Total	1602	1570	3172

a. What is the probability that a randomly chosen person from the survey group is a man?

$$\frac{1570}{3172} = 0.49$$

b. What is the probability that the highest level of education completed by a randomly chosen person from the survey group is a bachelor's degree?

$$\frac{1002}{3172} = 0.32$$

c. If a randomly chosen person from the survey group is a woman, what is the probability that she has earned a graduate or professional degree?

* cover up "men" column

$$\frac{377}{1602} = 0.24$$

d. If a randomly chosen person from the survey group has a bachelor's degree as their highest level of education, what is the probability that they are a man?

* cover up all rows except for bachelors degree

$$\frac{463}{1002} = 0.46$$