

WHAT PERCENTAGE OF PEOPLE SHARE COMMON GENETIC TRAITS?

Background

A gene is a sequence of DNA that codes for one protein. Proteins determine many of the physical characteristics (called traits) of people. For example, the ability to roll your tongue into a U-shape is determined by your proteins. Other genetic traits include free ear lobes, a widow's peak, a straight thumb, and right-handedness.

Descriptions of Genetic Traits

- Tongue Rolling - ability to roll the edges of the tongue so the tongue forms a U-shape
- Free Ear Lobes - lobe of the ear hangs freely below the point of attachment to head
- Widow's Peak - midpoint of the hairline across the forehead forms a distinct peak
- Straight Thumb - when the thumb is extended directly up from the palm, the top part and the bottom part of the thumb form a straight line.
- Left Thumb Over Right - when the hands are folded naturally, the left thumb crosses over the right thumb.
- Left Arm Over Right - when the arms are crossed naturally in front of the chest, the left arm crossed over the right arm.
- Right-Handedness - when doing common tasks, such as picking up a pencil, the right hand is used more than the left.

Data Chart - record the results to your survey below

Total # of Students: _____ Total # of Females: _____ Total # of Males: _____

Trait	Total	# Females	# Males	% Females	% Males
Tongue Rolling					
Free Ear Lobes					
Widow's Peak					
Straight Thumb					
Left Thumb Over Right					
Left Arm Over Right					
Right Handed					

Analysis and Conclusions:

1. Based on your results, make a prediction about which trait is dominant by circling the dominant trait listed below.
 - a. Tongue rolling or non-tongue rolling
 - b. Widow's peak or straight hairline
 - c. Left handedness or right handedness
 - d. Hitchhiker's thumb or straight thumb
 - e. Attached ear lobes or free earlobes
2. Describe how you decided which traits were dominant in question #1.

3. Imagine that you found seventy percent of people that you surveyed were right handed. After doing some research you came to find that left handedness was a dominant trait. Does it make sense that more people would be right handed? Why do you think your survey came out with these results?

4. What trait had the highest percentage of occurrence? What trait had the lowest percentage of occurrence?

5. If having the ability to roll your tongue is a dominant trait, draw a Punnett square showing a homozygous tongue roller crossed with a heterozygous individual.

- a. What % are tongue rollers?
- b. What % are non-tongue rollers?
- c. List all possible genotypes.
- d. List all possible phenotypes.

- e. You surveyed 1000 couples with these genotypes who had children. Based on your Punnett square, predict how many of the offspring would be tongue rollers.
- f. Do you think the number you predicted in part e will be exact?