

Name: _____

Investigating Inherited Human Traits: Face Lab

Problem:

How are traits inherited?

Introduction:

Heredity is the passing on of traits, or characteristics, from parent to offspring. The units of heredity are called genes. Genes are found on the chromosome in a cell. The combinations of genes for each trait occur by chance.

When one gene in a pair is stronger than the other gene, the trait of the weaker gene is masked, or hidden. The stronger gene is the *dominant* gene, and the gene that is masked is the *recessive*. The dominant genes are written as capital letters and recessive genes are written as lowercase letters. If both genes in a gene pair are the same, the trait is said to be *homozygous*, or pure. If the genes are not similar, the trait is said to be *heterozygous*, or hybrid. Sometimes genes are neither dominant nor recessive, and then they are called codominant. The result of such a situation is a blending of traits.

The genetic makeup of an individual is known as its *genotype*. The observable physical characteristics of an individual that are the result of its *genotype* are known as its *phenotype*. In humans, the sex of an individual is determined by the particular combination of the two sex chromosomes. Individuals that have two X chromosomes (XX) are females, whereas those with an X and a Y chromosome (XY) are males.

In this investigation, you will observe how the results of different gene combinations produced certain traits.

Procedure:

1. Determine the gender of the offspring by flipping a coin. If it lands on heads then the father passes on an X chromosome and the baby is a female, and if it lands on tails then the father passes on the Y chromosome and the baby is a male. Record the gender in the table.
2. For all the coin tosses you will now make, **heads will represent the dominant gene** and **tails will represent the recessive gene**.
3. Flip the coin two times for each trait listed in the table in Figure 1. After each flip, record the trait of your offspring by writing its genotype and phenotype under the corresponding column.
4. Using the recorded traits, draw the facial features for your offspring and be sure to complete the following questions.

Questions:

1. Define genotype and phenotype. _____

2. What percent chance did you have of producing a male offspring? A female offspring? Why? Explain your answer. _____

3. Define Heterozygous and homozygous. _____

4. How might it be possible for you to show a trait when neither of your parents shows it? _____

Face Lab Data Table

	Trait	Dominant (both heads)	Hybrid (one of each)	Recessive (both tails)	Genotype
X or Y	Gender (Sex)	Female	Male	-----	
R or r	Shape of face	Round	Oval	Square	
C or c	Cleft in chin (chin dimple)	None	None	Present	
H or h	Hair	Curly	Wavy	Straight	
W or w	Widows peak ("V" forehead)	Present	Present	None	
E or e	Spacing of eyes	Close together	"Normal"	Far apart	
A or a	Shape of eyes	"squinty"	Square	Round	
S or s	Position of eyes	Straight forward	Cross - eyed	Looking opposite directions	
L or l	Size of eyes	Large	Medium	Small	
L or l	Length of eyelashes	Long	Short	Not present	
B or b	Shape of eyebrows	Bushy	Fine	Not present	
N or n	Position of eyebrows	Not connected	Not connected	Uni-brow	
L or l	Size of nose	Large Nose	Large Nose	Small Nose	
T or t	Shape of lips	Thick	Normal	Thin	
L or l	Size of ears	Large	Normal	Small	
L or l	Size of mouth	Large	Normal	Small	
F or f	Freckles	Present	Present	None	
D or d	Dimples	Present	Present	None	

Draw your Face below