

Name _____

Date _____

Class _____

Human Inheritance Lab
(40 minutes)

Human Inheritance Lab

Background: By now you have most likely discussed the basics of genetics, especially those that were described by Gregor Mendel, the Austrian monk that is commonly referred to as the “father of classical genetics”. Many of these traits are influenced by several pairs of genes and the possibilities are seemingly limitless. For this activity we will assume that the traits we are studying are regulated by the alleles of only one gene, however most are governed by several genes. Each of these traits comes from the genes contributed to the embryo from both the mother and the father.

Purpose: the purpose of this laboratory experience is:

















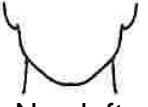
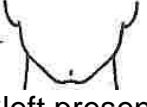
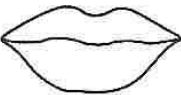
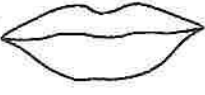




- to understand the mechanism of inheritance.
- to determine your phenotype for several traits.
- to be able to determine your genotype (as far as possible) for these traits.
- to interpret the genotypes of individuals in a pedigree.

Materials: The following materials are required to complete this lab experience:

- lab papers
- pen or pencil
- PTC paper (your teacher will supply this)

Procedure: The following procedure is utilized to perform this experience:

1. Working in pairs, observe the features expressed in this lab and complete the table included that shows the different features listed below:
2. The next several pages show the features you will be looking for as you observe the traits. In each case, circle the trait that **YOU** exhibit! Those features that do not include a picture and are shaded will be explained to you by your teacher as they are difficult to portray accurately.

Feature Name	Dominant	Heterozygous	Recessive
Shape of Ear Lobe	 Free	 Free	 Attached
Eye Color	Brown, hazel, green	Brown, hazel, green	Blue
Shape of hairline	 Widow Peak	 Widow Peak	 No Widow Peak
Ability to roll tongue	 Roller	 Roller	 Non-roller
Little finger	Bent	Bent	Straight
Ability to taste PTC	Can taste PTC	Can Taste PTC	Cannot taste PTC
Mid-Digital hair	Has MD Hair	Has MD Hair	No MD Hair
Hair curliness	 Curly	 Wavy	 Straight
Eyelash length	 Long	 Long	 Short
Chin cleft	 No cleft	 No cleft	 Cleft present
Lip shape	 Thick Lips	 Medium thickness lips	 Fine lips
Freckles	Freckles	Freckles	No freckles
Dimples	No dimples	No dimples	Dimples
Finger Interlock	Right over left	Right over left	Left over Right
Arm fold	Right over left	Right over left	Left over Right
Left/right footed	Right footed	Right footed	Left Footed
Hitchhiker's thumb	 Hitchhikers thumb	 Hitchhiker's thumb	 Straight Thumb

Data: The following data was collected during this lab experience:

Trait and Symbols for Genes	Phenotype	Genotype
Shape of ear lobe (LL, Ll, ll)		
Eye color (BB, Bb, bb)		
Shape of hairline (WW, Ww, ww)		
Ability to roll tongue (RR, Rr, rr)		
Shape of little finger (CC, Cc, cc)		
Ability to taste PTC (PP, Pp, pp)		
Mid-Digital hair (HH, Hh, hh)		
Hair curliness (CC, Cc, cc)		
Eyelash length (LL, Ll, ll)		
Chin cleft (DD, Dd, dd)		
Lip shape (KK, Kk, kk)		
Freckles (FF, Ff, ff)		
Dimples (DD, Dd, dd)		
Finger Interlock (Ii, Ii, ii)		
Arm folding (AA, Aa, aa)		
Left/right footed (FF, Ff, ff)		
Hitchhiker's thumb (VV, Vv, vv)		

Sources of Images Used

Shape of Ear Lobes: http://www.usoe.k12.ut.us/curr/science/core/bio/biotestpool/Bio_S4_2.htm

Ability to roll tongue:

http://www.csun.edu/~vceed002/biology/genetics/genetics_activity/genetics_class.htm

Hitchhiker's thumb:

http://www.csun.edu/~vceed002/biology/genetics/genetics_activity/genetics_class.htm#thumb

The following images were taken from Miller and Levine's Laboratory Manual, Copyright 2000, Prentice Hall Publishers, ISBN 0-13-436796-0: Chin Cleft, Eyelash Length, Lip Shape, Freckles, Dimples, Shape of Hairline

Analysis Questions: Answer the following questions in the space provided.

1. Do you think anyone in class will have the same exact traits as you? Explain.

2. Why is it not always possible to determine exactly what your genotype is?

3. Do you think you will share common genetic traits with your parents? ...your grandparents? Why?

4. There are communities in Spain and also in Pennsylvania where polydactyly (extra toes and or fingers) is a common trait. Why does this trait tend to be passed on from generation to generation?

5. There have been many cases in history wherein a king divorces (or sometimes kills) his wife since she produces only daughters that cannot take over the throne when he dies. Why is this, genetically, an incorrect move?
