

# Heredity and Traits : Notes/W.S.-90

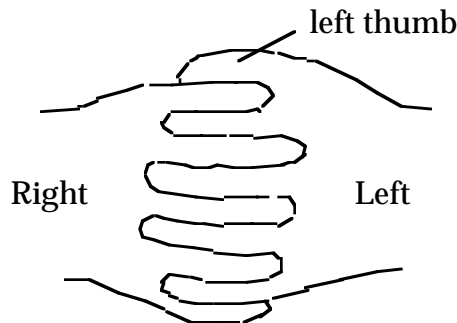
Characteristics, or traits, are determined by the DNA (genes) in the chromosomes. Each trait is determined by two genes, one from each parent.

Each gene may be dominant or recessive. If the dominant gene is present, then that characteristic is expressed. In order for the recessive gene to be expressed, that gene must come from both parents.

These rules were discovered by Mendel in his pea experiment. They work for many plants and animals including humans.

For humans, a good example of a trait is eye color. The brown eye color gene (B), is dominant. The blue eye color gene (b), is recessive.

Another example of a human trait is hand clasping. Most people clasp their hands with the left thumb on top. This gene (L) is dominant. The right thumb on top claspers, have only the recessive gene (r).



If the genes inherited from both parents are the same, then the offspring are said to be **homozygous**. If different genes are inherited, the offspring are said to be **heterozygous**.

The **genotype** is the type of genes inherited. The **phenotype** is the trait produced by those genes.

Problems:

1) Draw all of the Punnett squares for the following situations.

a) A father has blue eyes and a mother has brown eyes. There are two Punnett squares.

b) A father clasps his hands with the left thumb on top. The mother clasps her hands with the left thumb on top too. There are three Punnett squares.

2) A child is born to a blue eyed father and a brown eyed mother.

a) Give the two possible genotypes for the child.

b) Which genotype is homozygous? Which is heterozygous?

c) What are the phenotypes for each of the above genotypes?

Answers:

1)a)

		mother				mother	
		B	b			B	B
father	b	Bb	bb	father	b	Bb	Bb
	b	Bb	bb		b	Bb	Bb

b)

		L	L			L	r
L	L	LL	LL	L	L	LL	Lr
	L	LL	LL		L	LL	Lr

		L	r			L	r
L	L	LL	Lr	L	L	LL	Lr
	L	LL	Lr		r	Lr	rr

2)a) Bb, bb, b) bb is homozygous, Bb is heterozygous., c) Bb (brown eyes), bb (blue eyes).