Name _____
Human Biology Lab Manual Lab Report
Laboratory Exercise 10: Human Genetics

Activity 1: Determination of Genotypes and Phenotypes

1.	4.
2.	5.
3.	6.

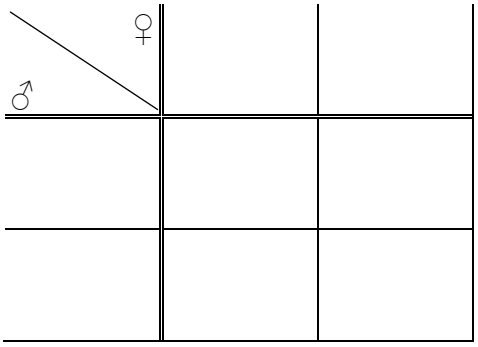
Activity 2: Practicing Punnett Square Analysis of Complete Dominance

For each complete dominance genetic problem, (a) determine the parents' genotypes based on Figure 10.2 illustration (b) construct a Punnett square, and (c) record the resulting genotypes and phenotypes expressed as percentages.

1. Determine the results of a monohybrid cross of a mother ♀ who is heterozygous for a widow's peak with a father ♂ who is homozygous recessive.

   (a) P_1 = ♀ _____ x ♂ _____

   (b) Punnett Square:



   (c) % Results:
   Genotype: _____
   _____
   _____

   Phenotype: _____
   _____
   _____

2. Determine the results of a dihybrid cross of a mother ♀ who is homozygous dominant for dimples and heterozygous for freckles with a father ♂ who is heterozygous for dimples and homozygous recessive for freckles.

(a) P_1 = ♀ _____ x ♂ _____

(b) Punnett Square:

♂ \ ♀				

(c) % Results:
Genotype: _____ _____

_____ _____

Phenotype: _____

_____

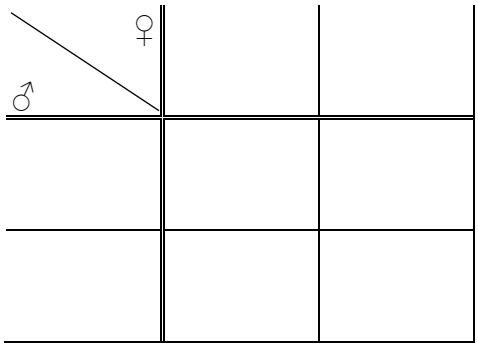
Activity 3: Practicing Punnett Square Analysis of Other Patterns of Inheritance

For each genetic problem, (a) determine the parents' genotypes based on Figure 10.2 illustration (b) construct a Punnett square, and (c) record the resulting genotypes and phenotypes expressed as percentages.

1. **Incomplete dominance**: Determine the results of a monohybrid cross of a mother who is homozygous recessive for straight hair with a father who is heterozygous for curly hair. (Refer to the lab manual for the genotypes.)

(a) P_1 = ♀ _____ x ♂ _____

(b) Punnett square



(c) % Results:

Genotype: _____

_____

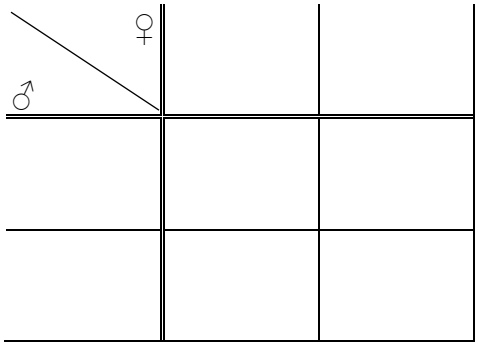
Phenotype: _____

_____

2. **Codominance**: Determine the results of a monohybrid cross of a mother who heterozygous for blood type B and a father who is heterozygous for blood type A. (Refer to Table 10.1 for genotypes.)

(a) P_1 = ♀ _____ x ♂ _____

(b) Punnett square



(c) % Results:

Genotype: _____ _____

_____ _____

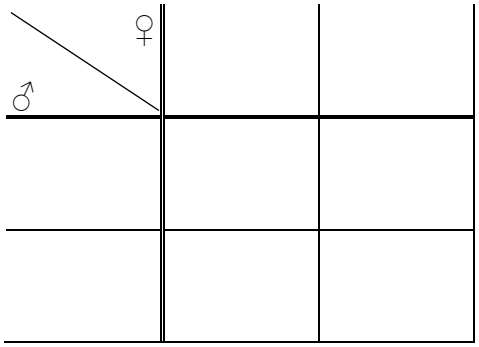
Phenotype: _____ _____

_____ _____

3. **X-linked recessive inheritance**: Determine the results of a monohybrid cross of a mother is who a carrier of red-green color blindness and a father who has red-green color blindness. (Refer to Table 10.2 for genotypes.)

(a) P_1 = ♀ _____ x ♂ _____

(b) Punnett square



(c) % Results:

Genotype: _____ _____

_____ _____

Phenotype: _____ _____

_____ _____

Activity 4: Creating your own Virtual Baby

In this activity, you and your partner will follow the laws of inheritance to predict what traits your offspring would have.

A. Determination of Phenotype and Genotype:

Each partner will record their own phenotype and the phenotypes of each of their parents for the following traits. Then determine your genotype for each trait. Refer to Figure 10.2 to determine dominant versus recessive. Record this information on the Lab Report.

Trait	Father's Phenotype	Mother's Phenotype	Your Phenotype	Your Possible Genotypes (circle one or more genotypes per trait)
Cleft chin				CC Cc cc
Widow's peak				WW Ww ww
Dimples				DD Dd dd
Hair Color				BB Bb bb
Freckles				FF Ff ff
Eye Color				EE Ee ee
Earlobe Attachment				LL Ll ll

B. Determination of Phenotype of F_1 generation:

Exchange genes with your lab partner virtually by filling out the following table on the Lab Report. Then draw a sketch of your possible child that includes each of the traits.

Trait	Your Genotype	Partner's Genotype	Children's Genotypic Ratio	Children's Phenotypic Ratio	Most likely Phenotype of Child
Cleft chin					
Widow's peak					
Dimples					
Hair Color					
Freckles					
Eye Color					
Earlobe Attachment					

Sketch of Virtual Baby:

Activity 5: Constructing a Pedigree

Choose one of the traits provided in Figure 10.2 and draw a pedigree of you and your family members on the Lab Report, showing the traits in each individual on the pedigree. Include as many family members as you can: grandparents, parents, aunts, uncles, siblings and cousins. Reference the pedigree symbol key.

Activity 6: Lab Review

1. What term refers to an individual's genes? _____
2. What type of chromosome is responsible for carrying most of the genes that determine an individual's traits? _____
3. Who developed the three fundamental laws of inheritance? _____
4. What phrase describes an individual with two dominant alleles? _____
5. What technique is used to predict the patterns of inheritance in offspring? _____
6. An individual will have blue eyes if the genotype is *ee*. Is blue eye color an autosomal dominant or autosomal recessive trait? _____
7. What pattern of inheritance occurs when both alleles for one trait are expressed in a heterozygote? _____
8. What pattern of inheritance occurs when a gene is present on the X chromosome? _____
9. What technique is used to determine the pattern of inheritance of a specific trait within a family over several generations? _____