Unit 9: Genetics

How does the work of Mendel explain how individuals inherit characteristics from their parents?

- Principles of genetics are based on Mendel's experiments
- Inheritance of genes occurs in predictable patterns that are governed by probability
- Sex-linkage affects the inheritance of traits

Key Vocabulary	Assignments	Due Date
Allele Dominant Gametes Gene Gene Segregation Genotype Heterozygous Homozygous Hybrid Mendel Phenotype Probability Recessive Sex Linked Trait Trait Zygote	**#1 - Read section 8.3 (pages 196 to 198)** a. Define bold words b. How is a gene different from an allele? c. How is a phenotype different from a genotype? **#2 – Read section 8.7 (pages 204 to 206)** a. What is the chromosomal abnormality that results in Down's syndrome? b. What is the chromosomal abnormality that results in Turner's syndrome? c. What is nondisjunction?	

Complete the following problems using a **separate piece or side of paper for each answer**. Show all work and clearly label all alleles and ratios. When you turn in this assignment please staple them together in order (write your name on all pages anyway). Be sure you write the number of the question you are answering in the upper right hand corner.

In mice the ability to run normally is a dominant trait. Mice with this trait are called running mice (R). The recessive trait causes mice to run in circles. Mice with this trait are called waltzing mice (r). Hair color is also an inherited trait in mice. Black hair (B) is dominant over brown hair (b).

1. Cross a heterozygous running mouse with a homozygous running mouse. What is the expected phenotypic ratio?
2. Cross a homozygous black mouse with a brown mouse. What are the expected phenotypic and genotypic ratios?
3. Cross a waltzing brown mouse with a waltzing brown mouse. What are the expected phenotypic and genotypic ratios?
4. Cross a homozygous running, heterozygous black mouse with a waltzing brown mouse. What is the expected phenotypic ratio?
5. Cross a homozygous running, brown mouse with a heterozygous running, homozygous black mouse. What is the expected phenotypic ratio?
6. Cross a heterozygous running, heterozygous black mouse with a heterozygous running, heterozygous black mouse. What is the expected phenotypic ratio?

Sex Linked Traits

X-linked traits come from genes that are located on the X chromosome, and not on the y. (Remembers women are XX and men are Xy). For example, hemophilia is a genetic disorder where a person can not form a blood clot. Hemophilia is a recessive sex-linked trait.

X^H or X^h y stays blank.

For the following questions take a single piece of unlined paper and fold it so it has four equal sized boxes when unfolded. Write your name up in the upper left hand corner and then number the boxes in the upper right hand corner. Solve one problem per a box. You must show your Punnett square for each problem.

1. Cross a carrier female with a male without hemophilia.
    a. What are the expected genotypic/phenotypic ratios?

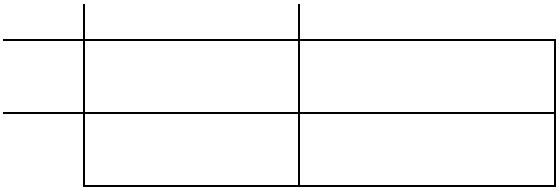
2. Cross a carrier female with a male with hemophilia.
    a. What are the expected genotypic/phenotypic ratios?

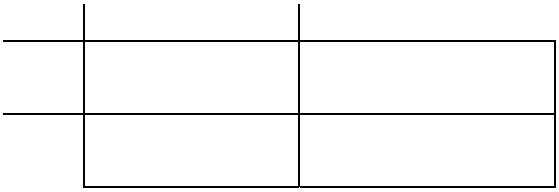
3. Cross a female with hemophilia with a male without hemophilia.
    a. What are the expected genotypic/phenotypic ratios?

Dihybrid Problems Worksheet

Parent 1 Genotype: _____

Parent 2 Genotype: _____





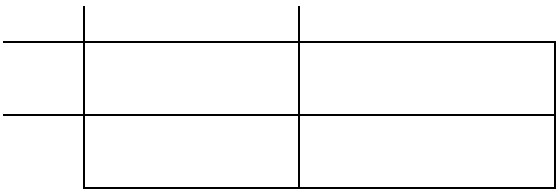
Genotypic Ratio	Phenotypic Ratio

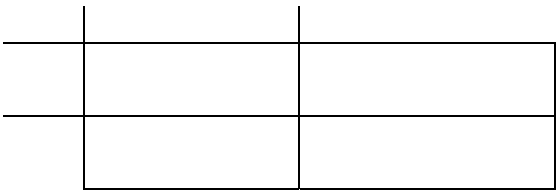
The Answer: _____

Dihybrid Problems Worksheet

Parent 1 Genotype: _____

Parent 2 Genotype: _____





Genotypic Ratio	Phenotypic Ratio

The Answer: _____