**Mendelian and Non-Mendelian Inheritance Practice**

**Simple Mendelian Inheritance (Show a Punnett Square for ALL answers)**

1. In tomatoes, red fruit (R) is dominant over yellow fruit (r). A plant that is homozygous for red fruit is crossed with a plant that is heterozygous for red fruit. What will be the genotypes and phenotypes of the offspring?

Genotypes:

Phenotypes:

1. In humans, being a tongue roller (R) is dominant over non-roller (r). A man who is a non-roller marries a woman who is heterozygous for tongue rolling, what percent of their children would you expect to be tongue rollers?
2. Cystic Fibrosis is a **recessive** genetic disease. If two parents are both carriers for Cystic Fibrosis, what probability do each of their children have of being born with the disease?

**Incomplete Dominance (Show a Punnett Square for ALL answers)**

1. Coat color in mice is incompletely dominant. Yellow (Y) and white (W) colored mice are homozygous, while cream-colored mice are heterozygous. If two cream-colored mice mate, what phenotypic ratio can we expect of their offspring? Show the Punnett Square.
2. In radishes, red (R) and white (W) are pure-breeding colors, while hybrids (RW) are purple. A red radish is crossed with a white radish
   1. What will be the **phenotype** of the resulting radishes?
   2. If two of the offspring radishes from part A are then crossed, what will be the **phenotype** of the radishes in the second generation? (If there is more than one, give the percentages) Show the Punnett Square.
   3. If a gardener would like to grow the maximum number of purple radishes, what should the **genotypes** of the parent radishes be? Use a Punnet Square to support your answer.

**Co-Dominance (Show a Punnett Square for ALL answers)**

1. Blood type in humans is co-dominant. There are A, B, and O alleles of blood type and a person can inherit two alleles of various combinations of these letters. If a mother has type AB blood and the father has type A blood (AA) what blood type should the children have?

\_\_\_\_\_% of the children should be type \_\_\_\_\_\_

\_\_\_\_\_% of the children should be type \_\_\_\_\_\_

1. In some chickens, the gene for feather color is controlled by codominance. The allele for black is B and the allele for white is W. The heterozygous phenotype is known as erminette (black and white spotted).

Give the genotype for

black chickens? \_\_\_\_ white chickens? \_\_\_\_ erminette chickens? \_\_\_\_

1. Two erminette chickens were crossed. Show the Punnett square.
2. What’s the probability they would have a black chick? \_\_\_\_%
3. What’s the probability they would have a white chick? \_\_\_\_%



1. A black chicken and an erminette chicken are crossed. Show the Punnett Square. What is the probability that they will have erminette chicks? \_\_\_\_%

**Sex-Linked Traits (Show a Punnett Square for ALL answers)**

1. In cats black is a sex-linked dominant trait (XB) and yellow is a recessive trait (Xb). The heterozygous condition (XB Xb) produces a calico colored cat. Show the results in a cross between a black female and a yellow male.
   1. How many of their offspring should be calico colored?
2. Hemophilia is a recessive disorder that reduces a person’s ability to form blood clots. People with hemophilia are often in danger of losing too much blood with even a small cut. Hemophilia is a sex-linked trait that is passed down on the X chromosome. If a woman is a carrier for Hemophilia and marries a man that is not affected by this disorder, draw a Punnett Square to answer the following questions
   1. What chance do their daughters have of inheriting hemophilia?
   2. What chance do their sons have of inheriting hemophilia?