**Different Types of Inheritance Notes**

Incomplete Dominance

When Mendel’s work was rediscovered, scientists repeated his experiments. Mendel’s results were true for peas and other plants again and again. However, when different plants were crossed, the results somewhat varied from Mendel’s predictions. One scientist crossed pure red four o’clock plants with pure white four o’clock plants. He expected to get all flowers. But to his surprise, all of the flowers were . Neither seemed to be . Had the flower colors become blended like paint colors? He crossed the pink flowers with each other and , , and flowers were produced.

The red and white alleles had not become blended. Instead, the allele for flowers and the allele for flowers resulted in an intermediate phenotype, a flower. is the production of a that is intermediate (or in-between) to those of the two homozygous parents. Flower color in four o’clock plants is inherited by incomplete dominance.

Multiple Genes

How many different shades of blue or brown eye color can you detect among your classmates? Eye color is an example of a single trait that is produced by a combination of many genes. occurs when a group of gene pairs act together to produce a single trait. The effect of each allele may be small, but the combination produces a . Fingerprints are another trait that is inherited through a combination of gene pairs. Many human traits are controlled by polygenic inheritance. Height, weight, body build, shape of eyes, lips, and ears are examples of some of these traits. It also occurs in plants and other animals. Grain color in wheat, milk production in cows, and egg production in chickens are also polygenic traits.

Sex-Linked Traits

Some inherited diseases or disorders are closely linked with the X and Y chromosomes that determine the sex of an individual. We call alleles inherited on a sex chromosome a

. Colorblindness and hemophilia are two disorders inherited on the chromosome. More are colorblind than . Also, are more likely to have hemophilia than females.

**Problem # 1** Cross a male with normal **Problem #2** Cross a normal male

vision (XY) with a female who is a carrier with a female who is colorblind.

for colorblindness.

Multiple Alleles and Co-dominance

Mendel studies traits in peas that were controlled by just two alleles. However many traits are controlled by more than two alleles. A trait controlled by more than two alleles is considered to be controlled by . One example of a trait controlled by multiple alleles is in humans. In 1900, one scientist found three blood types in the human population. He called them , , and .

A and B are both alleles. When a person inherits one and one for blood type, are expressed. The A and B alleles are considered to be . A person with both of these alleles has type blood. Both A and B are to the allele, which is .

A person with phenotype A blood inherited either the genotype or . A person with phenotype B blood inherited either genotype or . For a person to have type AB blood, an allele must be inherited from one parent and a allele must be inherited from the other parent. Finally, a person with blood has inherited an allele from both parents and has the genotype .