Punnett Problems 1:
Complete Dominance and Incomplete Dominance

Directions: For each of the following problems, complete the Punnett Square provided and fill in the information requested. The first problem is done for you.

Complete Dominance Problems

A. In fruit flies, a black body (B) is completely dominant over gray bodies (b.) Cross a homozygous black fly with a gray fly. What are the genotype and phenotype ratios that result?

Cross (parents): BB x bb

	B	B
b	Bb	Bb
b	Bb	Bb

Genotype ratio: 100% Bb
Phenotype ratio: 100% Black

B. The ability to curl the tongue (T) is completely dominant to the inability to do so (t). Fred (heterozygous tongue curler) marries Wilma (also heterozygous.) What are the predicted genotype and phenotype ratios of their offspring?

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

C. In humans, normal vision is completely dominant (N) and myopia (nearsightedness) is recessive (n). A homozygous normal female marries a myopic male. What would be the genotypes and phenotypes of the offspring?

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

Incomplete Dominance Problems

D. In four o'clock flowers, gene R (for red flowers) is incompletely dominant over gene r (for white flowers.) Heterozygotes (Rr) would produce pink flowers. Cross two pink plants. What are the genotypes and phenotypes of each type of offspring?

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

F. In chickens, FF produces extreme frizzle (very brittle and curly feathers), Ff has mild frizzle and ff has normal feathers. An extreme frizzle hen is mated with a normal rooster. What will the chickens look like? What will their genotype be?

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

Lethal Alleles

G. Dwarfism is a rare <u>dominant</u> trait in humans. However, when two dominant alleles (DD) are present together, it is lethal. (the fertilized egg will be miscarried) Two dwarfs marry and have children. What is the probability the children born to them will be of normal height?

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

What is the probability the children born to them will be of normal height? _____

H. A certain type of mouse has a gene that codes for wrinkled or smooth skin. Two wrinkled mice are mated and the offspring consist of ⅓ smooth and ⅔ wrinkled mice. There are also occasional births of dead and badly deformed mice. Use a Punnett square to explain what is occurring with this type of inheritance.

The alleles W/w can be used for this problem.

Cross (parents): _____ x _____

Genotype ratio:
Phenotype ratio:

from http://cms.gavirtualschool.org/Shared/Science/Biology17/Genetics/Biology_Genetics_Shared4.html