

### Monohybrid Cross Practice Problems

- In hogs, white color is dominant and black is recessive. Homozygous black hogs are crossed with homozygous white hogs.
  - What is the color of the  $F_1$ ?
  - If 2 members of the  $F_1$  are crossed, what are the possible genotypic and phenotypic ratios of the offspring?
- A black rooster and a black hen are crossed. Some of the offspring are black, and some are white. Explain the genetics of the cross.
- Two pea plants are crossed. Both are heterozygous for color. Yellow is dominant, and green is recessive. What is the expected genotypic and phenotypic ratios of the offspring?
- Finger hair is dominant. No finger hair is a recessive trait. If a woman without finger hair marries a man with finger hair, whose mother had no finger hair, what is the probability that their offspring will have finger hair? Explain and use a Punnett Square.
- The polled (hornless) trait is dominant in cattle. The horned trait is recessive.

A polled bull is bred to 3 cows:

  - Cow A (horned) has a polled calf
  - Cow B (horned) has a horned calf
  - Cow C (polled) has a horned calf

What are the genotypes of the 4 parents?
- In sheep, white wool is dominant, and black wool is recessive. Occasionally, a black sheep appears in a flock. Black wool is useless. How could a farmer eliminate the black wool trait from the flock?
- A pea, which is heterozygous is crossed with a pea that is homozygous recessive. What is the phenotype of the offspring of the  $F_1$  generation?
- A short haired rabbit is crossed with a long haired rabbit. Long hair is dominant in rabbits. What are the possible genotypes of the long haired rabbit?

Cross each possible genotype with the short haired rabbit. What are the genotypic and phenotypic ratios of each possibility?
- Brown hair is dominant over blonde hair, in humans. A heterozygous male marries a blonde female. Express, in %, what the chance is of them having a blonde child.
- Two dwarf (under 4'5") parents give birth to a son. The gene for "normal" height is dominant, while the gene for dwarfism is recessive. What are the genotypes of the parents? What percentage of their children will be dwarfs?
- The gene for myopia is recessive in humans. A family has 8 children. As they grow older, it is found that two of them are nearsighted. What is the genotype of the children's parents? Prove it using genetics.

### Dihybrid Cross -- Question Sheet

- 1.) Determine the following genotype and phenotype ratios in the following cross  
RRSs x RrSS.  
R = Round    r = Wrinkled  
S = Shiny    s = Dull
  
- 2.) Determine the genotype and phenotype ratios for a cross that occurs  
between PpTt x pptt.  
P = Purple    p = Yellow  
T = Tall    t = Short
  
- 3.) In pea plants green seeds are dominant over yellow seeds, and white flowers are dominant over green flowers. Determine the genotype and phenotype ratios created when a heterozygous green seed, white flowered male is crossed with a heterozygous green seed, white female.
  
- 4.) What are the genotype and phenotype ratios that occur when two F1 generation offspring are crossed who come from a homozygous dominant father that has white flowers and whorled leaves with a homozygous recessive female that has pink flowers and jaded leaves.
  
- 5.) What genotypes and phenotypes would be expected from the following from the following cross?  
B = Black hair                                      b = Blond Hair  
C = Curly Hair                                      c = Straight Hair
  - a) BBCC x bbcc
  - b) BbCc x BbCc
  - c) BbCC x bbCC
  - d) BbCC x BBcc
  - e) BBcc x Bbcc
  
- 6.) In tomatoes, red fruit color is dominant to yellow, round shaped fruit is dominant to pear shaped, and tall vine is dominant to dwarf vine. What is the appearance of the F1 generation if pure tall plant bearing red, round fruit is crossed with a pure dwarf plant bearing yellow, pear shaped fruit. What are the genotype and the phenotype ratios if an F1 is crossed with an F1 to Produce an F2 generation.