

4. In Ann Arbor there is a group of creatures known as mazers. It comes in three colors, the most common homozygous individuals are blue (BB), the heterozygous individuals are yellow (Bb), and rarely other homozygous individuals are white (bb).

a. What type of inheritance is followed in mazers.

b. What would be the genotypes and phenotypes of the offspring if a yellow mazer is crossed with a white mazer?

5. Raccoons have rings around their tails and a habit of washing their food in water before eating it. Suppose that both of these traits are controlled via incomplete dominance so that wide bands on the tail are BB, medium sized bands are Bb, and narrow bands are bb. Also, washing food is WW, washing some of their food is Ww, and washing no food is ww. How many of each genotype will be in the F₂ generation resulting from a cross of two raccoons, both with medium sized tall bands and that wash some of their food?

6. The diversity of Texas longhorn coloration is celebrated by many modern longhorn breeders. Longhorns may be white (C^WC^W), red (C^RC^R), or roan (C^RC^W). Roan longhorns have a mixture of both white hairs and red hairs due to a codominant gene.
- What kind(s) of gametes can a red male longhorn of the P generation produce?
 - What kinds(s) of gametes can a white female longhorn of the P generation produce?
 - If the parents are the ones in parts a and b, what is the expected genotype and phenotypic ratio of the F_1 ?
 - What is the expected genotypic and phenotypic ratio of F_2 ?
7. A family of six includes four children, each of whom has a different blood type: A, B, AB, and O. What are the genotypes of the parents for this trait?
8. Mrs. Smith and Mrs. Doe were roommates at Harris Hospital and both had daughters at about the same time. After Mrs. Smith took Susie home, she became convinced that the babies were switched. Blood tests were performed with the following results. Determine if a switch had occurred or not.
- Mr. and Mrs. Smith were both type AB.
 - Mr. and Mrs. Doe were both type A.
 - Susie Smith was type A and Debbie Dow was type O.

9. Kunal has type B blood. His wife Amala is unsure of her blood type. If their first child, Khalid, is type B, their second offspring, Simran, is AB and the twins, Sunit and Nikil, are A. Can you determine the genotypes of Kunal and Amala?

10. In a well-publicized paternity case, the following facts were unearthed; the mother, a strikingly beautiful, twice-convicted murderess, is blood type A. Her daughter, Bethany, is type O, and the alleged father, a mild-mannered felon, is type B.

a. Could he be the father of Bethany? Prove it.

b. The mother is being charged with another murder. Her alleged victim is blood type O. The murder scene was cleaned up fairly thoroughly before the police had a chance to collect evidence. The forensics test were able to find B antibodies at the scene. If these antibodies came from the murderer, could the mother be the killer?