

Practice Dihybrid Crosses – Honors Biology

Complete a Punnett Square for each of the following crosses. Give the genotypic and phenotypic ratios of the cross.

1. About 70% of Americans perceive a bitter taste from the chemical phenylthiocarbamide (PTC). The ability to taste this chemical results from a dominant allele (T) and not being able to taste PTC is the result of having two recessive alleles (t). Albinism is also a single locus trait with normal pigment being dominant (A) and the lack of pigment being recessive (a). A normally pigmented woman who cannot taste PTC has a father who is an albino taster. She marries a homozygous, normally pigmented man who is a taster but who has a mother that does not taste PTC
2. Wolves are sometimes observed to have black coats and blue eyes. Assume that these traits are controlled by single locus genes and are located on different chromosomes. Assume further that normal coat color (N) is dominant to black (n) and brown eyes (B) are dominant to blue (b). Suppose the alpha male and alpha female of a pack (these are the dominant individuals who do most of the breeding) are black with blue eyes and normal colored with brown eyes, respectively. The female is also heterozygous for both traits.
3. In the breeding season, male Anole lizards court females by bobbing their heads up and down while displaying a colorful throat patch. Now, suppose that anoles prefer to mate with lizards who bob their heads fast (F) and have red throat patches (R) and that these two alleles are dominant to their counterparts, slow bobbing and yellow throats. A male lizard heterozygous for head bobbing and homozygous dominant for the red throat patch mates with a female that is also heterozygous for head bobbing but is homozygous recessive for yellow throat patches.
4. Carrion beetles lay their eggs in dead animals and then bury them in the ground until they hatch. Assume that the preference for fresh meat (F) is dominant to the preference for rotted meat and that the tendency to bury the meat shallow (S) is dominant to the tendency to bury the meat deep. Suppose a female carrion beetle homozygous dominant for both traits mates with a male homozygous recessive for both traits.
5. A blue-eyed, left-handed woman marries a brown-eyed, right handed man who is heterozygous for both traits. Blue eyes and left-handedness are recessive.
6. Cross a heterozygous tall plant with heterozygous yellow seeds with another of the same genes. Tall and yellow are dominant
7. Cross a homozygous tall plant with heterozygous yellow seeds with another plant that is heterozygous tall and homozygous for green seeds. Tall and yellow are dominant traits.
8. Cross a homozygous wrinkled pea pod plant with homozygous wrinkled peas with another plant that is heterozygous smooth pea pods and homozygous for wrinkled peas. Smooth pea pods and smooth peas are dominant traits
9. Cross a homozygous smooth pea pod plant with homozygous smooth peas with another plant that is heterozygous smooth pea pod and homozygous for wrinkled peas. Smooth pea pods and smooth peas are dominant traits.