

Bikini Bottom Genetics

Name _____
 Scientists at Bikini Bottoms have been investigating the genetic makeup of the organisms in this community. Use the information provided and your knowledge of genetics to answer each question.

1. For each genotype below, indicate whether it is a heterozygous (He) OR homozygous (Ho).

- TT _____ DD _____ Ff _____ tt _____
 Dd _____ ff _____ Tt _____ BB _____ FF _____

Which of the genotypes in #1 would be considered purebred?
 Which of the genotypes in #1 would be hybrids?

2. Determine the phenotype for each genotype using the information provided about SpongeBob.



- Yellow body color is dominant to blue.
 YY _____ Yy _____ yy _____
 Square shape is dominant to round.
 SS _____ Ss _____ ss _____

3. For each phenotype, give the genotypes that are possible for Patrick.



- A tall head (T) is dominant to short (t). Tall = _____ Short = _____
 Pink body color (P) is dominant to yellow (p). Pink body = _____ Yellow body = _____

4. SpongeBob SquarePants recently met SpongeSusie Roundpants at a dance. SpongeBob is heterozygous for his square shape, but SpongeSusie is round. Create a Punnett square to show the possibilities that would result if SpongeBob and SpongeSusie had children. HINT: Read question #2!

A. List the possible genotypes and phenotypes for their children.

- B. What are the chances of a child with a square shape? _____ out of _____ or _____ %
 C. What are the chances of a child with a round shape? _____ out of _____ or _____ %

5. Patrick met Patti at the dance. Both of them are heterozygous for their pink body color, which is dominant over a yellow body color. Create a Punnett square to show the possibilities that would result if Patrick and Patti had children. HINT: Read question #3!

A. List the possible genotypes and phenotypes for their children.

- B. What are the chances of a child with a pink body? _____ out of _____ or _____ %
 C. What are the chances of a child with a yellow body? _____ out of _____ or _____ %

6. Everyone in Squidward's family has light blue skin, which is the dominant trait for body color in his hometown of Squid Valley. His family brags that they are a "purebred" line. He recently married a nice girl who has light green skin, which is a recessive trait. Create a Punnett square to show the possibilities that would result if Squidward and his new bride had children. Use B to represent the dominant gene and b to represent the recessive gene.



- A. List the possible genotypes and phenotypes for their children.
 B. What are the chances of a child with light blue skin? _____ %
 C. What are the chances of a child with light green skin? _____ %
 D. Would Squidward's children still be considered purebreds? Explain!

7. Assume that one of Squidward's sons, who is heterozygous for the light blue body color, married a girl that was also heterozygous. Create a Punnett square to show the possibilities that would result if they had children.

- A. List the possible genotypes and phenotypes for their children.
 B. What are the chances of a child with light blue skin? _____ %
 C. What are the chances of a child with light green skin? _____ %

8. Mr. Krabbs and his wife recently had a Lil' Krabby, but it has not been a happy occasion for them. Mrs. Krabbs has been upset since she first saw her new baby who had short eyeballs. She claims that the hospital goofed and mixed up her baby with someone else's baby. Mr. Krabbs is homozygous for his tall eyeballs, while his wife is heterozygous for her tall eyeballs. Some members of her family have short eyes, which is the recessive trait. Create a Punnett square using T for the dominant gene and t for the recessive one.



- A. List the possible genotypes and phenotypes for their children.
 B. Did the hospital make a mistake? Explain your answer.

Monohybrid Practice Problems

Show Punnett Square, give Genotype AND Phenotype for each on your own paper!

1. In humans brown eyes are dominant over blue eyes. What type of offspring would you expect if you crossed a heterozygous brown eyed person to a heterozygous brown eyed person?
2. A widow's peak hairline is dominant to straight hairline. Cross a heterozygous widow's peak hairline person to a straight hairline person.
3. In humans premature gray hair is dominant over normal hair coloring. Cross a homozygous premature gray haired person to a homozygous normal haired person.
4. In humans tongue rolling is dominant to non-tongue rolling. What would be the expected type of offspring if a homozygous tongue roller was crossed to a heterozygous tongue roller?
5. Brown hair is dominant over light colored hair. Cross two light haired people.
6. In a certain plant yellow fruit is dominant to white fruit. A heterozygous plant with yellow fruit is crossed with a plant with white fruit. Determine the probable offspring.
7. In a certain animal, black fur is dominant to white fur. Determine the possible offspring from crosses between:
 - a. Homozygous black x white
 - b. Heterozygous black x heterozygous black
8. In garden peas, round peas are dominant to wrinkled peas. If you crossed a homozygous dominant and homozygous recessive what would be the genotype and phenotype of the offspring?
9. In corn, normal kernels are dominant to waxy kernels. If you crossed a waxy kernel plant to a heterozygous normal plant what type of seeds would be produced?
10. Tall plants are dominant to short plants in the garden pea plant. Cross a heterozygous tall plant to a heterozygous tall plant.