

I can:

Determine the meaning of symbols, key terms, and other genetic-specific words and phrases

Calculate probability of genetic crosses using a punnet square

Use the following information to answer the questions below:

SpongeBob loves growing flowers for his pal Sandy! Her favorite flowers, Poofkins, are found in red, blue, and purple. Use the information provided and your knowledge of *incomplete dominance* to complete each section below.

Written below is the correct genotype for each color if R represents a red gene and B represents a blue gene.

Red -  $I^R I^R$       Blue -  $I^B I^B$       Purple -  $I^R I^B$

1. What would happen if SpongeBob crossed a Poofkin with red flowers with a Poofkin with blue flowers? Complete the Punnett square to determine the chances of each flower color.

- a. Give the genotypes and phenotypes for the offspring:


- b. What are the chances the plants would have red flowers? \_\_\_\_\_ %  
 c. What are the chances the plants would have purple flowers? \_\_\_\_\_ %  
 d. What are the chances plants would have blue flowers? \_\_\_\_\_ %

2. What would happen if SpongeBob crossed two Poofkins with purple flowers? Complete the Punnett square to show the probability for each flower color.

- a. Give the genotypes and phenotypes for the offspring.


- b. What are the chances the plants would have red flowers? \_\_\_\_\_ %  
 c. What are the chances the plants would have purple flowers? \_\_\_\_\_ %  
 d. What are the chances the plants would have blue flowers? \_\_\_\_\_ %

3. What would happen if SpongeBob crossed a Poofkin with purple flowers with a Poofkin with blue flowers? Complete the Punnett square to show the probability for plants with each flower color.

- a. Give the genotypes and phenotypes for the offspring.


4. If SpongeBob planted 100 seeds from this cross, how many should he expect to be purple? Does this mean he will for sure have that many purple flowers? Justify your answer.

SpongeBob and his pal Patrick love to go jellyfishing at Jellyfish Fields! The fields are home to a special type of green jellyfish known as Goobers and only really great jellyfishermen are lucky enough to catch some on every trip. Many of the jellyfish are yellow (Y) or blue (B), but some end up green (YB) as a result of **incomplete dominance**. Use this information to help you complete each section below.

5. What would happen if SpongeBob and Patrick crossed two “goobers” or green jellyfish? Complete the Punnett square to help you determine the probability for each color of jellyfish.

a. Give the possible genotypes and phenotypes for the offspring.


b. What are the chances the offspring would be yellow? \_\_\_\_\_ %

c. What are the chances they would be blue? \_\_\_\_\_ %

d. What are the chances that they would be “goobers” (green)? \_\_\_\_\_ %

6. What would happen if they crossed a yellow jellyfish with a goober? Complete the Punnett square to help you determine the probability for each color of jellyfish.

a. Give the possible genotypes and phenotypes for the offspring.


b. What are the chances the offspring would be yellow? \_\_\_\_\_ %

c. What are the chances they would be blue? \_\_\_\_\_ %

d. What are the chances they be “goobers” (green)? \_\_\_\_\_ %

7. What would happen if they crossed a blue jellyfish with a yellow jellyfish? Complete the Punnett square to help you answer the questions.

a. If 100 jellyfish were produced from this cross, how many would you expect for each?

Yellow - \_\_\_\_\_ Blue - \_\_\_\_\_ Goobers - \_\_\_\_\_

8. If SpongeBob had a goober and wanted to make a bunch of blue baby jellyfish...what would he cross his goober jellyfish with to produce the most blue jellyfish. Justify your answer with Punnett squares.

Shelley, one of Bob's cousins, has a beautiful hot pink shell with white stripes which is a result of *codominance*. In school she is learning about genetics and how snails inherit their shells. She learns that if you have a white shell you have the allele  $I^H I^H$  and if you have a hot pink shell you have the alleles  $I^T I^T$  and if you are like her with pink and white stripes then you have the alleles  $I^H I^T$ . So she sets up some problems to see what might happen to her potential offspring as a result of her genotype.

9. What would happen if Shelley with her striped shell crossed with a solid white shell? Determine the genotypes of the offspring using a Punnet square to show your work.

a. Give the possible genotypes and phenotypes for the offspring.


- b. What are the chances the offspring would be Hot Pink? \_\_\_\_\_  
 c. What are the chances the offspring would be White? \_\_\_\_\_  
 d. What are the chances the offspring would be striped? \_\_\_\_\_

10. What would happen if Shelley with her striped shell crossed with another striped shell? Determine the genotypes of the offspring using a punnet square to show your work.

a. Give the possible genotypes and phenotypes for the offspring.


- b. What are the chances the offspring would be Hot Pink? \_\_\_\_\_  
 c. What are the chances the offspring would be White? \_\_\_\_\_  
 d. What are the chances the offspring would be striped? \_\_\_\_\_

11. Shelley knows that her mom had a hot pink shell but is unsure about the color of her dad's shell. Chances are her dad had what color shell? Justify your answer using a Punnet square.

12. Using the information from the previous question, could her dad have another color shell? Justify your answer using a Punnet square.

**SpongeBob and Patty have traveled the ocean looking for new recipes for the new store that they are hoping to open out of the water! They are hoping to make new patties people have never seen before. They have found if they cross red patties from home with yellow patties from their travels, a brand NEW red with yellow spots patty is formed as a result of *codominance*! Use this information to help you complete each section below.**

13. What would happen if SpongeBob and Patty crossed a red patty with another patty that is red with yellow spots? Determine the genotypes of the offspring using a Punnet square to show your work.

a. Give the possible genotypes and phenotypes for the offspring.


- b. What are the chances the offspring would be Red? \_\_\_\_\_  
 c. What are the chances the offspring would be Yellow? \_\_\_\_\_  
 d. What are the chances the offspring would be Spotted? \_\_\_\_\_

14. What would happen if SpongeBob and Patty crossed a spotted patty with another patty that is red with yellow spots? Determine the genotypes of the offspring using a Punnet square to show your work.

a. Give the possible genotypes and phenotypes for the offspring.


- b. What are the chances the offspring would be Red? \_\_\_\_\_  
 c. What are the chances the offspring would be Yellow? \_\_\_\_\_  
 d. What are the chances the offspring would be Spotted? \_\_\_\_\_

15. If Spongebob had a patty that was yellow, how could he make a patty that is red? Justify your answer using a Punnet Square.

16. Patty is so busy in the kitchen crossing patties that things have become unorganized. Patty just made a red patty and knows that one of the parent patties was striped but is unsure about the other parent. Patty thinks that is was a red patty but could it also be something else? Justify your answer using a Punnet square.