Bikini Bottom Genetics
Incomplete Dominance

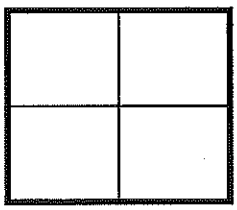
Name _____

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.

1. Write the correct genotype for each color if R represents a red gene and B represents a blue gene.

Red - _____ Blue - _____ Purple - _____

2. 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.



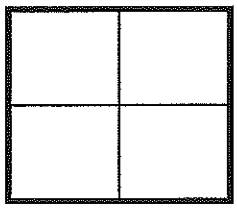
(a) Give the genotypes and phenotypes for the offspring.

(b) How many of the plants would have red flowers? _____%

(c) How many of the plants would have purple flowers? _____ %

(d) How many of the plants would have blue flowers? _____ %

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



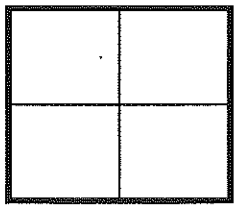
(a) Give the genotypes and phenotypes for the offspring.

(b) How many of the plants would have red flowers? _____%

(c) How many of the plants would have purple flowers? _____ %

(d) How many of the plants would have blue flowers? _____ %

4. 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.



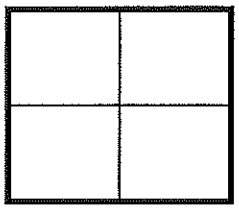
(a) Give the genotypes and phenotypes for the offspring.

(b) If SpongeBob planted 100 seeds from this cross, how many should he expect to have of each color?

Purple flowers - _____ Blue flowers - _____ Red flowers - _____

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 (YY) or blue (BB), but some end up green 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.



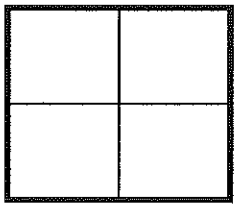
(a) Give the possible genotypes and phenotypes for the offspring.

(b) What percentage of the offspring would be yellow? _____%

(c) What percentage would be blue? _____ %

(d) What percentage 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.



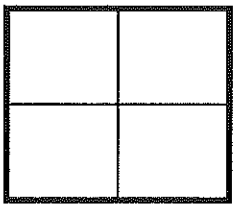
(a) Give the possible genotypes and phenotypes for the offspring.

(b) What percentage of the offspring would be yellow? _____%

(c) What percentage would be blue? _____ %

(d) What percentage would be "goobers" (green)? _____ %

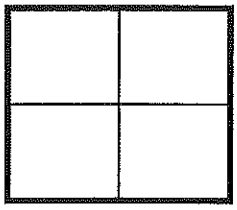
7. What would happen if they crossed a blue jellyfish with a yellow jellyfish? Complete the Punnett square to help you answer the questions.



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

Yellow - _____ Blue - _____ Goobers - _____

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



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

Yellow - _____ Blue - _____ Goobers - _____

CO-DOMINANCE/INCOMPLETE DOMINANCE

Name_____

1. **Explain the difference between incomplete and codominance.**

Co-Dominance Problems

2. In some chickens, the gene for feather color is controlled by codominance. The allele for black is B and the allele for white is W. The heterozygous phenotype is known as erminette (black and white spotted).

a. What is the genotype for black chickens? ____

b. What is the genotype for white chickens? ____

c. What is the genotype for erminette chickens? ____

3. If two erminette chickens were crossed, what is the probability that:

a. They would have a black chick? ____%

b. They would have a white chick? ____%

Parents: ____ X ____

4. A black chicken and a white chicken are crossed. What is the probability that they will have erminette chicks? ____%

Parents: ____ X ____

In shorthorn cattle, when a red bull (RR) is crossed with a white cow (WW), all the offspring are roan—a spotted, red and white or milky red color.

5. What offspring are expected from mating a roan bull and a roan cow?

6. What phenotypes would you expect from a cross between a red bull and a white cow?

7. Two short-tailed (Manx) cats are bred together. They produce three kittens with long tails, five short tails, and two without any tails. From these results, how do you think tail length in these cats is inherited? Show the genotypes for both the parents and the offspring to support your answer.

Incomplete Dominance Problems

8. In snapdragons, flower color is controlled by incomplete dominance. The two alleles are red (R)
and white (W). The heterozygous genotype is expressed as pink.

a. What is the phenotype of a plant with the genotype RR? _____

b. What is the phenotype of a plant with the genotype WW? _____

c. What is the phenotype of a plant with the genotype RW? _____

9. A pink-flowered plant is crossed with a white-flowered plant. What is the probability of producing a pink-flowered plant? ____%

Parents: ____ X ____

10. What cross will produce the most pink-flowered plants? Show a punnett square to support your answer.

Parents: ____ X ____

11. In Andalusian fowls, black individuals (B) and white individuals (W) are homozygous.

A homozygous black bird is crossed with a homozygous white bird. The offspring are all bluish-gray. Show the cross as well as the genotypes and phenotypes of the parents and offspring.

12. What results if a black individual is crossed with a bluish-gray individual? (SHOW YOUR WORK)

13. If two bluish-gray individuals were crossed, what would be the ratios for both phenotype and genotype of the offspring?