Biology: Unit VIII- Genetics
SpongeBob Punnett Squares #4

Name_____
Date_____ **Period**_____

Incomplete Dominance and Codominance in Bikini Bottom

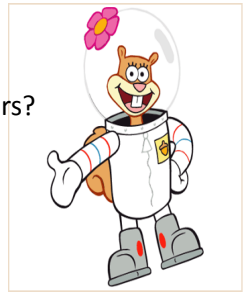
SpongeBob loves growing flowers for his pal Sandy! Her favorite flowers, Poofkins, are found in Purple, White, and Lavender (light purple). Use your knowledge of **INCOMPLETE DOMINANCE** to complete each problem.

1. With incomplete dominance, how many phenotypes should you expect to see? _____

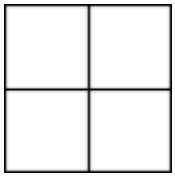
2. Which genotype will represent the blended or "in-between" form? _____

3. Write the correct genotype for each color if **P** represents a Purple allele and **W** represents a white allele.

   Purple - _____ White - _____ Lavender - _____



4. What would happen if SpongeBob crossed a Poofkin with purple flowers with a Poofkin with white flowers? Complete the Punnett square to determine the chances of each flower color.



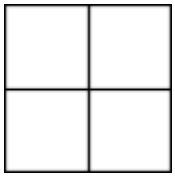
   (a) Identify the genotypes of the parents: _____ x _____

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

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

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

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



   (a) Identify the genotypes of the parents: _____ x _____

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

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

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

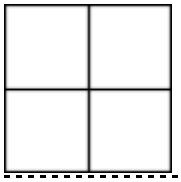
6. Gary the snail has tall eyeballs. It is also possible for snails to have short or medium length eyeballs.

   (a) What are the possible phenotypes: _____ _____ _____

   (b) What are the possible genotypes _____ _____ _____

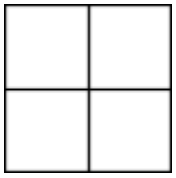
   Determine the probability of tall, medium, and short eyeballs for Gary's offspring if he mates with a medium-length eyeballed snail.

   (c) Gary's genotype: _____ Mate's Genotype: _____



   (d) Percent Tall Eyes: _____Percent Medium Eyes: _____Percent Short Eyes: _____

7. Coat color in squirrels can be brown, white, or an intermediate tan color. Sandy has a tan coat and has recently met a white coated squirrel. Determine the probability of each phenotype of coat color in their offspring, should their relationship work out.



   (a) What are the possible phenotypes: _____ _____ _____

   (b) What are the possible genotypes _____ _____ _____

   (c) Sandy's genotype: _____ Boyfriend's Genotype: _____

   (d) Percent Brown Coats: _____Percent Tan Coats: _____Percent White Coats: _____

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

8. With codominant alleles how many phenotypes should you expect to see? _____

9. Which genotype would represent the condition when both phenotypes are expressed TOGETHER? _____

10. What would happen if SpongeBob and Patrick crossed two "goobers" or spotted jellyfish? Complete the Punnett square to help you determine the probability for each type of jellyfish.

(a) Identify the genotypes of the parents: _____ x _____

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

(c) What percentage would be blue? _____ %

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

11. 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) Identify the genotypes of the parents: _____ x _____

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

(c) What percentage would be blue? _____ %

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

12. In plankton, eye color follows a codominant inheritance pattern. Plankton has a yellow eye, some plankton have red eyes, while other plankton red and yellow spotted eyes. If Plankton, with a yellow eye, mates with a red/yellow spotted eyed plankton, what is the probability of eye color in their offspring?

(a) Identify the genotypes of the parents: _____ x _____

(b) What percentage of each type of eye color could be produced?

Red - _____ Yellow - _____ Spotted - _____

13. In crabs, the size of the claw follows the codominant pattern of inheritance. Crabs can have two large claws, one large and one small claw (heterozygous), and two small claws. Mr. Krabbs is homozygous for large claws and Mrs. Krabbs is heterozygous and therefore has one large claw and one small claw.

(a) Give Identify the genotypes of the parents: _____ x _____

(b) What percentage of each phenotype could be produced?

2 Large claws - _____ 1 large/1 small - _____ 2 small claws - _____

14. One of their offspring has two small claws. Give one plausible explanation as to how this could have happened…if the child **is** biologically theirs.