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).

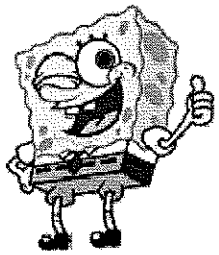
TT _____ Bb _____ DD _____ Ff _____ tt _____ dd _____

Dd _____ ff _____ Tt _____ bb _____ 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.

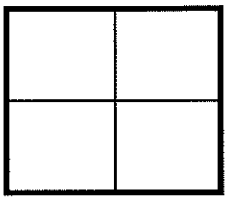
A tall head (T) is dominant to short (t).

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!

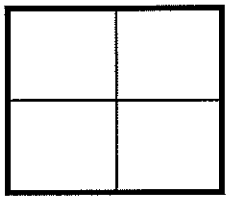


A. List the possible genotypes and phenotypes for their children.

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!

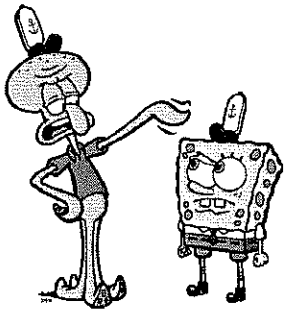


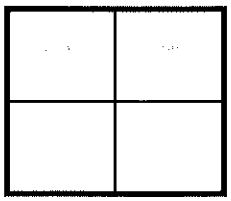
A. List the possible genotypes and phenotypes for their children.

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.





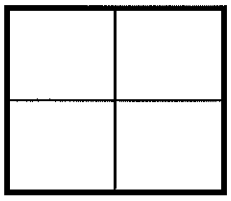
A. List the possible genotypes and phenotypes for their children.

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.

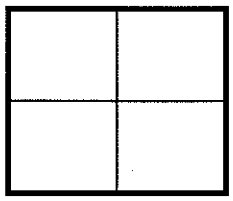


A. List the possible genotypes and phenotypes for their children.

B. What are the chances of a child with light blue skin? ____%

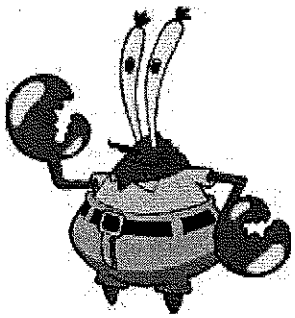
C. What are the chances of a child with light green skin? ____%

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.

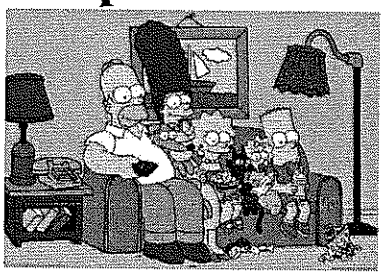
B. Did the hospital make a mistake? Explain your answer.



Name _____

Date ____ Hour ___

The Simpsons Genetics



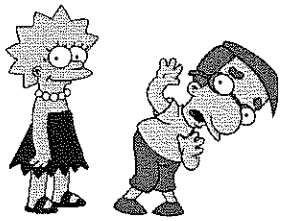
1. Marge and Homer are heterozygous for normal hair pattern (if you can call being bald <u>or</u> having a blue bee-hive normal) and have 3 children (Bart, Lisa, and Maggie)…all of which have spiky hair. If normal hair pattern (N) is dominant to spiky hair (n), what would the Punnett square of a cross between Marge and Homer look like?

2. If normal hair pattern (N) is dominant to spiky hair (n), what must be the <u>genotype</u> of all 3 kids?

3. If <u>blue hair (B) is dominant</u> to blonde hair (b), what must <u>Marge's genotype</u> be (assuming homer has homozygous blonde **bb** hair) to have all 3 children with blonde hair? Use the Punnett square to solve…

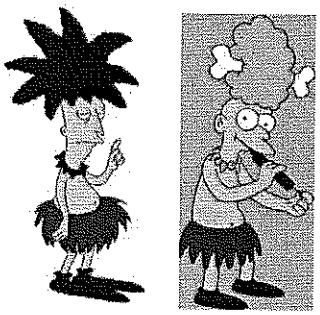
4. What is the chance of Homer and Marge's 4th child having <u>blue hair</u>?

5. What is the chance of Homer and Marge's 4th child having <u>blonde hair</u>?



6. If Lisa (homozygous for blonde) were to marry and reproduce with her brother's long time friend, Milhouse (who is homozygous for blue hair), what would the resulting Punnett square look like.

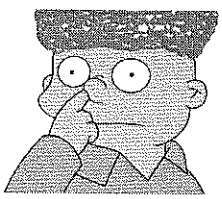
7. What would the resulting phenotype(s) from the cross be?



8. Side Show Bob (on left with brown curly hair) and Side Show Mel (on Right with curly green hair) recently compared their genetics to determine if they are brothers separated at birth (they both look great in grass skirts). For hair color, brown is dominant (B) to green (g). If Side Show Bob (who is homozygous for brown hair) lived with his birth parents, both of which had lovely curly brown hair, could Mel have come from this family? Explain using a Punnett square.

9. Patty and Selma (Marge's older twin sisters) both fall in love with Side Show Bob. Both sisters have purple hair (b), which is recessive to brown (B). If either sister were to marry and reproduce with Bob, what would the resulting Punnett square look like?

10. What would the resulting phenotype(s) of a cross between Patty or Selma and Bob be?



10. If Ralph (on left) found Side Show Bob, and claimed to be his biologic son from his marriage with Selma, could this be? Let's say that Ralph has light purple hair like Patty and Selma…explain your answer below