**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

Bb ff

DD Tt

Ff bb

tt BB

dd FF

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

1. 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.

QQ

Qq

qq

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

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

Short =

Rose body color (R) is dominant to yellow (r).

Rose body = Yellow body =

1. 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!
2. List the possible genotypes and phenotypes for their children.

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1. What are the chances of a child with a square shape? out of or %
2. What are the chances of a child with a round shape? out of or %
3. What is the genotypic ratio? \_\_\_\_QQ : \_\_\_\_Qq : \_\_\_\_\_qq
4. What is the phenotypic ratio? \_\_\_\_\_ Square: \_\_\_\_\_\_ Round
5. Patrick met Patti at the dance. Both of them are **heterozygous for their Rose 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!
   1. List the possible genotypes and phenotypes for their children.

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* 1. What are the chances of a child with a Rose body? out of or %
  2. What are the chances of a child with a yellow body? out of or %
  3. What is the genotypic ratio? \_\_\_\_RR : \_\_\_\_Rr : \_\_\_\_\_rr
  4. What is the phenotypic ratio? \_\_\_\_\_ Rose : \_\_\_\_\_\_ Yellow

1. 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.**
2. List the possible genotypes and phenotypes for their children.

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1. What are the chances of a child with light blue skin? %
2. What are the chances of a child with light green skin? \_\_\_\_\_ %
3. What is the genotypic ratio? \_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_
4. What is the phenotypic ratio? \_\_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_\_
5. Would Squidward’s children be considered purebreds? Explain!
6. Assume that one of Squidward’s sons, is heterozygous for the light blue body color, married a girl that was also heterozygous for light blue body color. Create a Punnett square to show the possibilities that would result if they had children.
   1. List the possible genotypes and phenotypes for their children.

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* 1. What are the chances of a child with light blue skin? %
  2. What are the chances of a child with light green skin? %
  3. What is the genotypic ratio? \_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_\_
  4. What is the phenotypic ratio? \_\_\_\_\_\_\_\_: \_\_\_\_\_\_\_