

Bikini Bottom – Dihybrid Crosses

Name _____

Use the chart to identify the genotypes of the following traits:

- Heterozygous round eyes, blue body _____
- Hybrid eye shape, purebred roundpants _____
- Purebred roundpants, heterozygous long nose _____

| Trait | Dominant Gene | Recessive Gene |
|------------|-----------------|----------------|
| Body Shape | Squarepants (S) | Roundpants (s) |
| Body Color | Yellow (Y) | Blue (y) |
| Eye Shape | Round (R) | Oval (r) |
| Nose Style | Long (L) | Stubby (l) |

4. SpongeBob’s aunt, who is a roundpants, has a cute stubby nose. She has finally found the sponge of her dreams and is ready to settle down. Her fiancé always comments on how adorable her nose is (he says it reminds him of his mother’s – aww, how sweet!). They wonder what the chances are of that trait being passed on. Her fiancé is a purebred squarepants and is a hybrid for his long nose.

A. Identify the genotypes of the aunt and her fiancé.

Aunt = Roundpants, Stubby Nose = _____ Fiancé = Purebred Squarepants, Long Nose = _____

B. What are the possible gamete combinations for each person?

Aunt = _____ Fiancé = _____

C. What are the possible genotypes for their children? _____

5. As we know, SpongeBob is heterozygous for his yellow body color and his squarepants, while his wife SpongeSusie is blue and has roundpants. Use this information to answer the following questions.

A. Give the genotypes for each.

SpongeBob = _____ SpongeSusie = _____

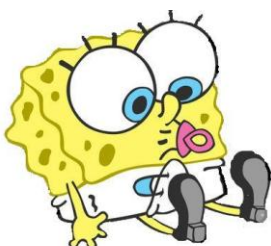


B. What are the possible gamete combinations for each person?

SpongeBob = _____ SpongeSusie = _____

C. Complete the Punnett square based on the information provided in #5.

| | | | | |
|-------|--|--|--|--|
| _____ | | | | |
| _____ | | | | |
| _____ | | | | |
| _____ | | | | |



D. Answer the questions based on your Punnett square.

What is the chance of a blue baby? _____

What is the chance of a blue squarepants? _____

What is the chance of a squarepants? _____

What is the chance of a purebred recessive for both traits? _____

6. In starfish, pink body color (P) is dominant to orange (p), and thick eyebrows (T) are dominant over thin (t) ones. Patrick, who is heterozygous for body color but purebred for thick eyebrows, has met Patti, who is recessive for both traits.



- A. What is Patti's phenotype? _____
- B. Is it possible for the new couple to have offspring that resemble their mother? Explain.

- C. Before Patrick commits to this relationship, he would like to guarantee that his offspring would have his thick eyebrows as he thinks they make him smarter! You need to provide evidence for or against the marriage with regards to eyebrows ONLY.

7. While Squidward's family boasts about being a purebred line for dominant light blue skin color, they are also purebred for a less distinguished trait: the recessive trait of baldness. Lack of hair causes Squidward some self-esteem issues that he does not want his children to face. He would like to ensure that his offspring have hair AND with his blue skin color. What traits should he look for in a bride?



- A. Must she have hair? Explain. _____

- B. Must she be blue? Explain. _____

Squidward Traits:
Skin Color
 Blue = B, Green = b
Hair
 Hair = H, Bald = h

C. Squidward has found a potential bride prospect with the green squid Octavia. While Octavia has _____ hair, her father does not. Determine the chances of their child being blue and having hair.

Squidward's Genotype = _____ Octavia's Genotype = _____

D. Use the genotypes in above to complete the Punnett square below and then answer the questions.

| | | | |
|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

- E. Answer these questions based on your Punnett square.
- For which traits, if any, is it possible for their offspring to be purebred?
- What is the probability of their children being heterozygous for both traits? _____