

**Bikini Bottom – Dihybrid Practice**

Name \_\_\_\_\_

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

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)

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

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 has purebred long nose.

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

Aunt – Roundpants, Stubby Nose = \_\_\_\_\_

Fiancé – Purebred Squarepants, Long Nose = \_\_\_\_\_

- What are the possible gamete combinations for each person? Aunt – \_\_\_\_\_ Fiancé – \_\_\_\_\_
- What are the possible genotypes for their children? \_\_\_\_\_

7. What are the genotypes of SpongeBob, who is heterozygous for his yellow body color and his squarepants, and his wife SpongeSusie, who is blue and has roundpants?

SpongeBob = \_\_\_\_\_                      SpongeSusie = \_\_\_\_\_

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

SpongeBob = \_\_\_\_\_                      SpongeSusie = \_\_\_\_\_

9. Complete the Punnett square based on the information provided in #7-8 and then answer the questions.


- What is the chance of a blue baby? \_\_\_\_\_
- What is the chance of a squarepants? \_\_\_\_\_
- What is the chance of a blue squarepants? \_\_\_\_\_
- What is the chance of a purebred recessive for both traits? \_\_\_\_\_

10. 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.

What is Patti's phenotype? \_\_\_\_\_

Is it possible for the new couple to have offspring that resemble their mother? Explain.

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11. Before Patrick commits to this relationship, he would like to guarantee that his offspring would have his thick eyebrows. (He thinks they make him smarter!) You need to provide evidence for or against the marriage. This question regards eyebrows ONLY.

12. 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?

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

Must she have hair? Explain. \_\_\_\_\_

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Must she be blue? Explain. \_\_\_\_\_

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13. 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 = \_\_\_\_\_ Octavia = \_\_\_\_\_

14. Use the genotypes in #13 to complete the Punnett square below and then answer the questions.


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? \_\_\_\_\_