

Bikini Bottom – Dihybrid Crosses

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 is a hybrid for his long nose.

- 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? _____

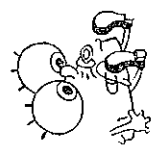
5. As we know, SpongeBob is heterozygous for his yellow body color and his squarepants, while his wife SpongeSusie is blue and has roundpants. Use this information to answer the following questions.

- Give the genotypes for each.
SpongeBob = _____ SpongeSusie = _____
- What are the possible gamete combinations for each person?
SpongeBob = _____ SpongeSusie = _____

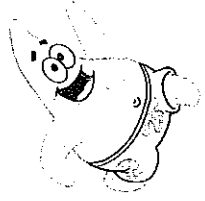
C. Complete the Punnett square based on the information provided in #5.

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.



- What is Patti's phenotype? _____
- 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?



- Must she have hair? Explain. _____
Squidward Traits:
Skin Color
Blue = B, Green = b
- Must she be blue? Explain. _____
Hair
Hair = H, Bald = h

C. Squidward has found a potential bride prospect with the green squid Octavia. White 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? _____

Dihybrid Cross Worksheet

1. Set up a punnett square using the following information:
- Dominate allele for tall plants = D
 - Recessive allele for dwarf plants = d
 - Dominate allele for purple flowers = W
 - Recessive allele for white flowers = w
 - Cross a homozygous dominant parent (DDWW) with a homozygous recessive parent (ddww)

2. Using the punnett square in question #1:
- a. What is the probability of producing tall plants with purple flowers?

Possible genotype(s)?

- b. What is the probability of producing dwarf plants with white flowers?

Possible genotype(s)?

- c. What is the probability of producing tall plants with white flowers?

Possible genotype(s)?

- d. What is the probability of producing dwarf plants with purple flowers?

Possible genotype(s)?

3. Set up a punnett square using the following information:

- Dominate allele for black fur in guinea pigs = B
- Recessive allele for white fur in guinea pigs = b
- Dominate allele for rough fur in guinea pigs = R
- Recessive allele for smooth fur in guinea pigs = r
- Cross a heterozygous parent (BbRr) with a heterozygous parent (BbRr)

4. Using the punnett square in question #3:
- a. What is the probability of producing guinea pigs with black, rough fur?

Possible genotype(s)?

- b. What is the probability of producing guinea pigs with black, smooth fur?

Possible genotype(s)?

- c. What is the probability of producing guinea pigs with white, rough fur?

Possible genotype(s)?

- d. What is the probability of producing guinea pigs with white, smooth fur?

Possible genotype(s)?

5. Set up a punnett square using the following information:

- Dominate allele for purple corn kernels = R
- Recessive allele for yellow corn kernels = r
- Dominate allele for starchy kernels = T
- Recessive allele for sweet kernels = t
- Cross a homozygous dominant parent with a homozygous recessive parent

7. Set up a punnett square using the following information:

- Dominate allele for normal coat color in wolves = N
- Recessive allele for black coat color in wolves = n
- Dominant allele for brown eyes = B
- Recessive allele for blue eyes = b
- Cross a heterozygous parent with a heterozygous parent

6. Using the punnett square in question #5:

- a. What is the probability of producing purple, starchy corn kernels?

Possible genotype(s)?

- b. What is the probability of producing yellow, starchy corn kernels?

Possible genotype(s)?

- c. What is the probability of producing purple, sweet corn kernels?

Possible genotype(s)?

- d. What is the probability of producing yellow, sweet corn kernels?

Possible genotype(s)?

8. Using the punnett square in question #7:

- a. What is the probability of producing a wolf with a normal coat color with brown eyes?

Possible genotype(s)?

- b. What is the probability of producing a wolf with a normal coat color with blue eyes?

Possible genotype(s)?

- c. What is the probability of producing a wolf with a black coat with brown eyes?

Possible genotype(s)?

- d. What is the probability of producing a wolf with a black coat with blue eyes?

Possible genotype(s)?