Bikini Bottom Genetics Incomplete Dominance

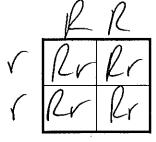
| Name | Key |
|------|-----|
| | |

SpongeBob loves growing flowers for his pal Sandy! Her favorite flowers, Poofkins, are found in red, blue, and purple. Use the information provided and your knowledge of incomplete dominance to complete each section below.

| 1. | Write the correct | genotype for ea | ch color if R represen | ts a red gene and B re | epresents a blue gene. |
|----|-------------------|-----------------|------------------------|------------------------|------------------------|
| | | | <i>[</i>] | \mathcal{I} | J |
| | | 1/ 1/ | | V/ /_ | |

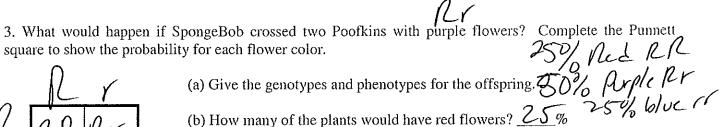
Red Blue Purple - Purple -

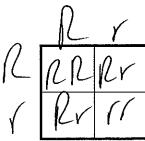
2. What would happen if SpongeBob crossed a Poofkin with red flowers with a Poofkin with blue flowers. Complete the Punnett square to determine the chances of each flower color. 100% Rr purple



(a) Give the genotypes and phenotypes for the offspring

- (c) How many of the plants would have purple flowers? 100 %

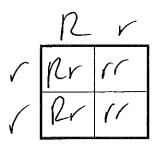




(b) How many of the plants would have red flowers? 25%

- (c) How many of the plants would have purple flowers? 50%
- (d) How many of the plants would have blue flowers? 25%

.4. What would happen if SpongeBob crossed a Poofkin with purple flowers with a Poofkin with blue flowers? Complete the Punnett square to show the probability for plants with each flower color.



(a) Give the genotypes and phenotypes for the offspring. 50% purple Rr

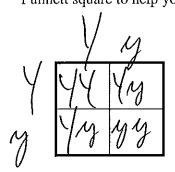
(b) If SpongeBob planted 100 seeds from this cross, how many should he expect to have of each color?

Purple flowers - 50 Blue flowers - 50 Red flowers -

Yellow YY blue yoy green Yy

SpongeBob and his pal Patrick love to go jellyfishing at Jellyfish Fields! The fields are home to a

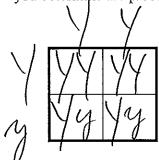
| special type of green jellyfish known as Goobers and only really great jellyfishermen are lucky enough to catch some on every trip. Many of the jellyfish are yellow (YY) or blue (BB), but some end up green as a result of incomplete dominance. Use this information to help you complete each section below. |
|--|
| 5. What would happen if SpongeBob and Patrick crossed two "goobers" or green jellyfish? Complete the Punnett square to help you determine the probability for each color of jellyfish. |



| (a) Give the possible genotypes and phenotypes for the offspring. 25% yellow 150% Grew 14 25% blue | Ky | y |
|--|----|---|
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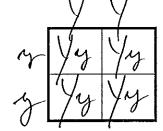
- (b) What percentage of the offspring would be yellow? $\angle 3\%$
- (c) What percentage would be blue? 25 %
- (d) What percentage would be "goobers" (green)? 50 %

6. What would happen if they crossed a yellow jellyfish with a gooder? Complete the Punnett square to help you determine the probability for each color of jellyfish.



- (a) Give the possible genotypes and phenotypes for the offspring. 50% Yellow // 50% / green
- (b) What percentage of the offspring would be yellow? 50_%
- (c) What percentage would be blue? \checkmark %
- (d) What percentage would be "goobers" (green)? 50%

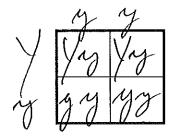
7. What would happen if they crossed a blue jellyfish with a yellow jellyfish? Complete the Punnett square to help you answer the questions.



If 100 jellyfish were produced from this cross, how many would you expect for each?

Yellow - O Blue - O Goobers - O O

8. What would happen if they crossed a blue jellyfish with a goober? Complete the Punnett square to help you answer the questions.

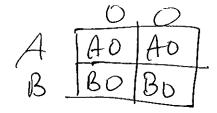


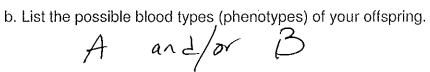
If 100 jellyfish were produced from this cross, how many would you expect for each?

Yellow - O Blue - SO Goobers - SO

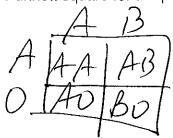
| Name | Date | Period |
|--|---|---|
| Worksheet: Mu | Itiple Allele C | rosses |
| Directions : Answer the following genetic of Square Cheat Sheet" attached at the end of of problems. It is essential that you know the sell. Remember when you are doing a g | of this worksheet to help you the all of the vocabulary inlo | solve the different types uded in the "cheat sheet" |
| STEP 1: Determine what kind of problem y STEP 2: Determine letters you will use to sTEP 3: Determine parent's genotypes. STEP 4: Make your punnett square and m STEP 5: Complete cross and determine posTEP 6: Determine genotypic and phenoty | specify traits. lake gametes ossible offspring. | |
| Multiple Allele Genetic Crosses | | |
| So far we have studied traits or genes that was one allele for brown hair color and one coded for by more than two alleles. One of Mendel's Principle of unit characteristics. | allele for white hair. Howev | er, some traits are |
| In humans, there are four types of blood and B are codominant to each other and th person with the genotype AA or AO will have | e O allele is recessive to bo | * * |
| a. What possible genotypes will prod | duce B type of blood? $\overline{B\ell}$ | B or BO |
| b. What is the only genotype that wil | I produce O type of blood? | 00 |
| c. What is the only genotype that wil | l produce AB type of blood? | AB |

- 2. You are blood type O and you marry a person with blood type AB. a. Complete a Punnett square for this cross.





- 3. In the 1950's, a young woman sued film star/director Charlie Chaplin for parental support of her illegitimate child. Charlie Chaplin's blood type was already on record as type AB. The mother of the child had type A and her son had type O blood.
 - a. Complete a Punnett square for the possible cross of Charlie and the mother.



b. The judge ruled in favor of the mother and ordered Charlie Chaplin to pay child support costs of the child. Was the judge correct in his decision based on blood typing evidence? Explain why or why not. *refer to any Punnett squares to support your answer.

No, Charlie cannot produce a child with O blood type.

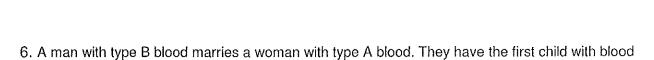
4. Suppose a newborn baby was accidentally mixed up in the hospital. In an effort to determine the parents of the baby, the blood types of the baby and two sets of parents were determined. Baby 1 had type O Mrs. Brown had type B Mr. Brown had type AB. Mrs. Smith had type B Mr. ms. B-B mr. S-B Smith had type B baby 00

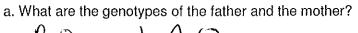
a. Draw Punnett squares for each couple (you may need to do more than 1 square/couple) couple)

b. To which parents does baby #1 belong? Why? Hint you may want to refer to your

Punnett squares. Buby belongs to the Smith's because the Brown's cannot produce a Child with D 6/002 type.

5. Assume that blood type is inherited as A and B dominant over O, but A and B are codominant over each other. Genotypes (Ia Ia) and (Ia i) are then phenotypically type A, genotypes (Ia Ia) and (Ia i) are type B, genotype (Ia Ia) is type AB, and genotype (i i) is type O blood. A man with blood type Ia Ia marries a woman with type AB blood. What are the genotypic and phenotypic ratios of the children?



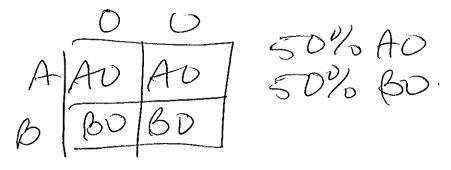


BO and AO b. What is the genotype and phenotype of the baby?



type O.

7. A man with type O blood marries a woman with type AB blood. What is the predicted genotypic and phenotypic ratios of their children?



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