Life Science
Genetics

Name _____

Date _____ Period _____

Monohybrid Crosses

In foxes, red coat color is determined by the dominant gene R; silver-black coat color is determined by the recessive gene r. A homozygous (pure) red male is crossed with a silver-black female (The P generation).

1. What is the ***genotype*** of the female? _____
2. What are the ***genotype percentages*** of their offspring? _____
3. What are the ***phenotype percentages*** of their offspring? _____
4. Use the Punnett square below to show the results of ***a cross between two of the offspring*** from the original cross.

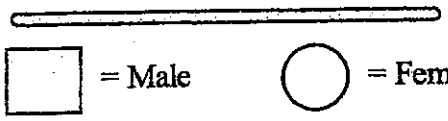
   (See the answer to question 2.) F_1 Generation _____ X _____

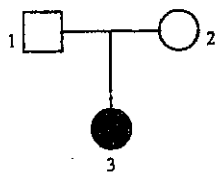
5. What are the ***genotype percentages*** of the offspring from the above cross?

   _____

6. What are the ***phenotype percentages*** of the offspring from the above cross?

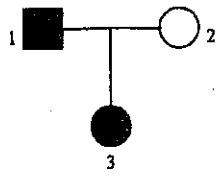
   _____



7. 

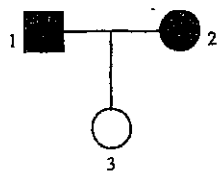
Daughter 3 has a certain characteristic (shaded). Could it be due to a dominant gene if neither parent 1 nor 2 has it?

_____ Yes _____ No

8. 

Could 1 and 3 represent a characteristic which is due to a dominant gene if female 2 does not have this gene?

_____ Yes _____ No

9. 

If this was a cross between foxes, could 1 and 2 have red coats and 3 have a silver-black coat?

_____ Yes _____ No

B = brown eyes b = blue eyes

10. A pure brown-eyed man marries a blue-eyed woman. What are the chances of getting a pure brown-eyed offspring? _____ How about the chances of getting a hybrid brown-eyed offspring? _____ How about getting a blue-eyed offspring? _____

11. A heterozygous brown-eyed man marries a blue-eyed woman. What are the chances there will be a homozygous brown-eyed offspring? _____ What are the chances of having any kind of brown-eyed offspring? _____

12. A brown-eyed man, whose mother was blue-eyed, marries a blue-eyed woman. What are the phenotypes (and percentages) of the offspring?

_____

In cattle the polled condition H (= no horns) is dominant to the horned condition h. A male calf is born with horns, yet both its parents have no horns.

13. What is the ***genotype*** of the calf? _____

14. What must be the ***genotypes*** of the parents? Father _____ Mother _____

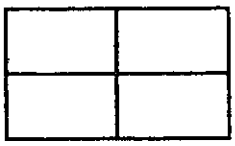
15. If this calf were later mated to a cow whose genotype was Hh, what is the probability that their offspring would have horns? _____

A rare blue-flowered plant was accidentally pollinated by pollen from a common white-flowered plant of the same species. All the offspring of this cross were white-flowered.

16. What color was ***recessive***? _____

17. What was the genotype of the F_1 offspring? _____

18. Using the Punnett square below, show how to produce another blue-flowered plant from the white offspring of this cross.
(See the answer to question 17.) F_1 Generation _____ X _____



The gene for the absence of eyes in fruit flies is recessive; that for normal eyes is dominant. An eyeless male is crossed with a female who is homozygous for normal eyes. They produce 200 offspring which are bred with each other and produce 3000 offspring.

19. How many of the 200 offspring (F_1) are probably blind? _____

20. How many of the 3000 offspring (F_2) probably have normal vision? _____

21. How many of the 200 offspring (F_1) would probably be hybrid for normal vision? _____

22. How many of the 3000 offspring (F_2) would probably be heterozygous for normal vision? _____