

Genetics Problems Part C

For all of the following problems make sure to show:

- 1)Key
- 2)Cross
- 3)Punnett square
- 4)Your answer written in a complete sentence.

In a dihybrid cross, when two traits are considered, the number of possible combinations in the offspring increases. Suppose that black hair (B) is dominant over blonde hair (b) and brown eyes (E) are dominant over blue eyes (e).

1. What would be the genotypic and phenotypic ratios if the father and mother have black hair (heterozygous) and brown eyes (heterozygous).

Genotype of father:

Genotype of mother:

Key:

Cross:

2. What would be the genotypic and phenotypic ratios if the father has black hair (heterozygous) and brown eyes (heterozygous) and the mother has blonde hair and blue eyes.

3. What would be the genotypic and phenotypic ratios if the father has black hair (dominant) and blue eyes and the mother has black hair (heterozygous) and brown eyes (dominant).

Inheritance of Traits

A. Understanding Ideas

Circle the word or phrase that best completes each of the following sentences.

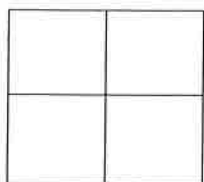
1. In most cells, chromosomes are located in the (nucleus, cytoplasm).
2. A human body cell should have (46, 23) chromosomes.
3. (Genetics, Crossing) is the study of how living things inherit traits.
4. Body cells have (twice, half) the number of chromosomes as sex cells.
5. A trait may be determined by one (cell, gene).
6. A female who has the gene pair (DD, Dd) can produce eggs containing only one kind of gene.
7. A (hybrid, recessive) gene may be hidden by a dominant gene.
8. Mendel first studied genetic crosses in (mice, peas).
9. A hybrid could be shown by (TT, Tt).
10. A person with a dominant trait may be (recessive, hybrid) for that trait.

B. Interpreting Ideas

Use the information below to work the Punnett squares and answer the questions. You need to work the Punnett squares to find the correct answers.

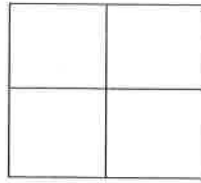
In fruit flies, dark body color, D, is dominant and light body color, d, is recessive.

11. One parent is pure recessive and the other is hybrid. How many of the offspring will be:



- a) dark? _____ b) light? _____ c) hybrid? _____

12. If both parents are hybrid, how many of the offspring will be:



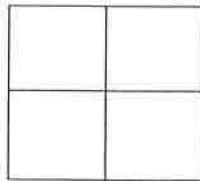
a) pure dominant? _____ b) pure recessive? _____ c) dark? _____ d) light? _____

13. A dark fruit fly and a light fruit fly produce 30 dark offspring and no light ones. The genes of the dark parent are represented by the letters _____.

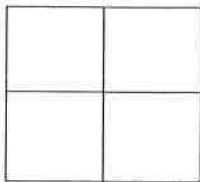
14. Use the terms dominant, recessive or hybrid to identify the gene combinations:

a) Aa _____ b) AA _____ c) aa _____

15. What are the possible gene combinations in the offspring if the father is HH for a trait and the mother is hh? _____.



16. Let gene B = brown eyes and gene b = blue eyes. If the father is Bb for eye color and the mother is bb for eye color, how many children will have blue eyes and how many will have brown eyes? _____.



D. Vocabulary Check

Match the items with the phrases. Write the correct choice on the line.

a) trait b) gene c) dominant d) genetics
 e) sex cells f) hybrid g) chromosomes h) pure

17. _____ The study of how characteristics are passed from parents to offspring.

18. _____ A living thing that has both dominant and recessive genes for a characteristic.

19. _____ Sperm and eggs.

28. Indicate the genotypes and phenotypes in each of the following matings among guinea pigs with black dominant over white hair.

a. Homozygous black and white.

b. Heterozygous and heterozygous

c. Homozygous and heterozygous black

29. In humans, normal pigmentation is due to a dominant factor or gene (C). Albino is the recessive allele (c). A normal man marries an albino woman. Their first child is albino. What are the genotypes of these three people? What is the probability that their next child will be albino?

30. Suppose a mother cat produced 18 calico kittens and 6 black kittens with the same male cat. What would be the most likely genotypes of these cats if calico is dominant to black?