

RAVEN CHAPTER 12 GUIDED NOTES: PATTERNS OF INHERITANCE

Raven 9th edition

1. In what way did both the “constancy hypothesis” and the “blending hypothesis” for the transmission of traits differ from observable patterns of inheritance?

2. Why was Mendel’s genetics research so much more valuable than his predecessors?

3. List a few of the advantages of Mendel’s choice of the garden pea as a model organism.

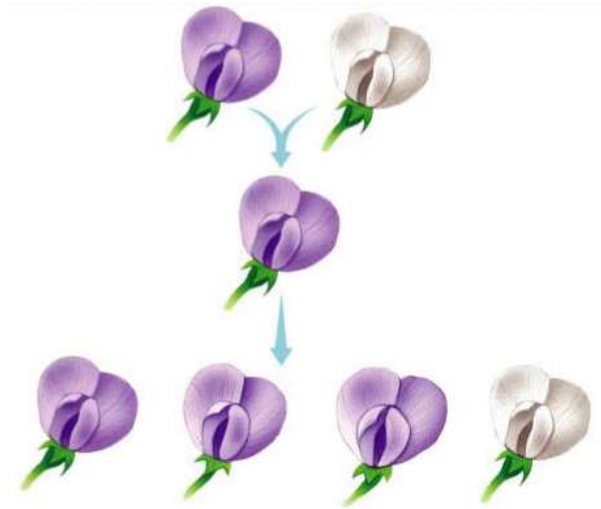
a. _____

b. _____

c. _____

d. _____

4. Use the diagram to label the generations: P, F1, F2, pure, hybrid, and make notes of Mendel's observations. Complete a Punnett square for each of the crosses.



5. What is the difference between an allele, a gene and a locus?

a. allele

b. gene

c. locus

6. Briefly define the following terms:

a. homozygous _____

b. heterozygous _____

c. phenotype _____

d. genotype _____

7. Explain Mendel's First Law of Heredity, the Law of Segregation.

8. Using the diagram in Question 4, describe how the Law of Segregation applies to the F1 and to the F2 generations.

9. When does the segregation of alleles occur?

10. What is the purpose of a test cross?

11. Explain Mendel's First Law of Heredity, the Law of Segregation. In other words, when two traits are on different (non-homologous) chromosomes, how are they inherited?

12. Indicate the phenotypic ratios that result in the F2 from the F1 cross (dihybrid cross)



13. Use the rules of probability to determine the expected ratio of offspring showing two recessive traits in the trihybrid cross ($PpYyRr \times Ppyyrr$).

14. Explain what a quantitative trait is. Give an example. What causes a trait to exhibit continuous variation?

15. Define and give an example of pleiotropy.

16. Describe and give an example of incomplete dominance.

17. Describe and give an example of environmental effects on gene expression.

18. Define and give an example of epistasis.

19. Briefly describe each of the following genetic disorders:

a. Tay-Sachs

b. Huntington disease

c. Hemophilia

d. Sickle cell anemia

20. Why are most genetic defects related to enzyme function recessive disorders?

21. Are most genetic disorders recessive?

22. Describe and give an example of codominance.

23. How is blood type an example of multiple alleles?

24. Describe some of the pieces of information that scientists discovered that contributed to the “Chromosome Theory of Inheritance”?

25. Summarize the Chromosomal Theory of Inheritance.

26. Describe Thomas Hunt Morgan’s first mutant fruit fly. Why was this fly so significant?

27. Show the cross P, F1, F2 for the white-eyed male mutant.

28. What is meant by a trait being sex-linked?

29. Why are sex-linked recessive traits more common in males than females?

30. What happens when we trace the inheritance of traits found on the same chromosome?

31. Explain how two genes on the same chromosome can still assort independently.

32. What is genetic recombination and when does it occur?

33. How is recombination frequency used to develop a genetic map?

34. Explain the difference between autosomal chromosomes and sex chromosomes.

35. What determines sex in humans?

36. How many X chromosomes are typically expressed in humans? _____

37. What happens to X chromosomes that are inactivated? How does this inactivation affect the expression of sex-linked traits in females?

38. How many Barr bodies would be found in a person with:
XXY_____ XO_____ XXX_____.

39. List and describe a few specific examples of non-disjunctions that occur in humans.

a. _____

b. _____

c. _____

d. _____

40. How can a parent learn the risks of having a child with a genetic disorder?

41. Explain procedures that can be used to detect genetic defects early in pregnancy.

a.

b.

