

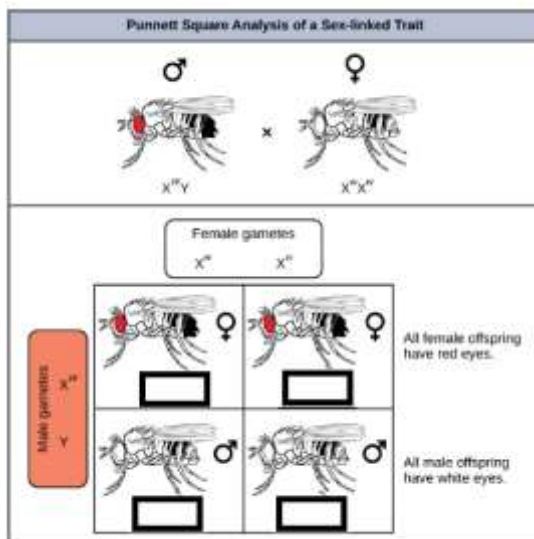
RAVEN CHAPTER 13 Chromosomes, Mapping and the Meiosis—Inheritance Connection

1. What physical events are the basis for Mendel's principles of segregation and independent assortment?

2. What type of fly led to Morgan's discovery that traits are located on specific chromosomes?

3. Explain how a testcross is used to confirm a hypothesis

4. Fill in the missing genotypes in the sex-linked test cross below



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.

10.

11.

12.

13. When does the segregation of alleles occur?

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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.

13.

- 14.
15. 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.

16.

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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?

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21. Are all 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.

26.

27. Summarize the Chromosomal Theory of Inheritance.

28. Describe Thomas Hunt Morgan’s first mutant fruit fly. Why

was this fly so significant?

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

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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.

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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.

39.

40.

41. How many Barr bodies would be found in a person with:
XXY _____ XO _____ XXX _____.

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

_____ b.

_____ c.

_____ d.

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

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

_____ b.

