Name _____ **Period** _____

AP Biology **Date** _____

RAVEN CHAPTER 13 GUIDED NOTES: PATTERNS OF INHERITANCE

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.

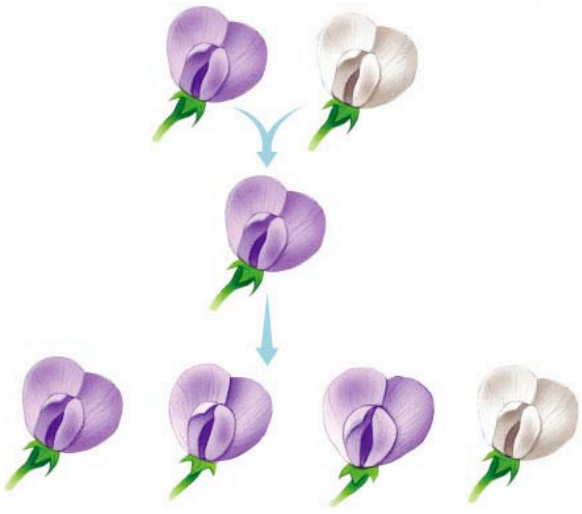
   a. _____

   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?

_____

_____

_____

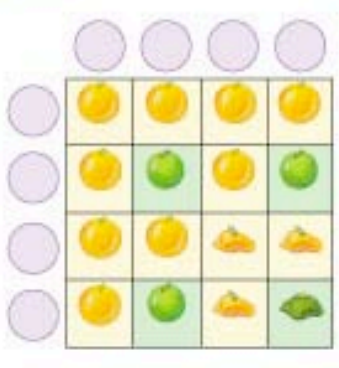
11. Explain Mendel's First Law of Heredity, the Law of Segregation. In other words, when two traits are on different (non-homologous) chromosomes, how are they inherited?

_____

_____

_____

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 X 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 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. 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. _____

_____