

Modern Genetics ▪ *Chapter Test***Modern Genetics****Multiple Choice**

Write the letter of the correct answer on the line at the left.

- ____ 1. An example of a human trait that is controlled by more than one gene is
- blood type.
 - widow's peak.
 - skin color.
 - dimples.
- ____ 2. A person who has one recessive and one dominant allele for a trait is called a
- homozygote.
 - carrier.
 - clone.
 - hybrid.
- ____ 3. A genetic disorder in which a person's blood clots very slowly if at all is
- sickle-cell disease.
 - cystic fibrosis.
 - Down syndrome.
 - hemophilia.
- ____ 4. The crossing of two individuals that have similar characteristics is referred to as
- genetic engineering.
 - hybridization.
 - inbreeding.
 - cloning.
- ____ 5. The transfer of genes from one organism to another is called
- hybridization.
 - cloning.
 - selective breeding.
 - genetic engineering.
- ____ 6. A chart that tracks which members of a family have a particular trait is called a
- pedigree.
 - Punnett square.
 - karyotype.
 - genome.
- ____ 7. The _____ chromosomes determine if a person is a male or female.
- multiple
 - sex
 - recessive
 - gene

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- _____ 8. In a pedigree, a square is used to represent a
- female.
 - male.
 - carrier.
 - clone.
- _____ 9. An abnormal condition that a person inherits through genes or chromosomes is a
- pedigree.
 - gene therapy.
 - genetic disorder.
 - karyotype.
- _____ 10. People with an extra copy of chromosome 21 have a disorder called
- Down syndrome.
 - colorblindness.
 - hemophilia.
 - sickle-cell disease.

Completion

Fill in the line to complete each statement.

11. A(n) _____ is all the DNA in one cell of an organism.
12. Professionals who help couples understand their chances of having a child with a particular genetic disorder are called _____.
13. In _____, breeders cross two genetically different individuals.
14. A(n) _____ is an organism that is genetically identical to the organism from which it was produced.
15. Inserting working copies of a gene directly into the cells of a person with a genetic disorder is referred to as _____.

True or False

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

- _____ 16. Three or more forms of a gene that code for a single trait are called multiple alleles.
- _____ 17. Sex-linked recessive traits are more common in females.
- _____ 18. Sickle-cell disease is a genetic disorder in which the body produces abnormally thick mucus.
- _____ 19. The process of selecting a few organisms with desired traits to serve as parents of the next generation is called genetic engineering.
- _____ 20. In karyotyping, a person's DNA is cut into fragments, which are separated to form a pattern.

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Using Science Skills: Interpreting Data

Interpret the data to answer each of the following questions. Write your answers in the spaces provided.

21. Smile dimples are controlled by a dominant allele on a single gene. Whitney has smile dimples, but her husband Alberto and son Pedro do not. What is the chance that Whitney and Alberto's next child will have smile dimples? Draw a Punnett square to show how you arrived at your answer.

22. Although Janele's blood is normal, her brother Randy has sickle-cell disease. Janele is worried about having a child with the disease. Janele just found out that her husband Terence has one allele for sickle-cell disease. As their genetic counselor, determine Janele and Terence's chances of having a child with sickle-cell disease. How would you explain the results of your analysis to the couple?

23. Janice's mother has type AB blood, and her father has type O blood. What blood type(s) could Janice have? Draw a Punnett square to explain your answer.

Essay

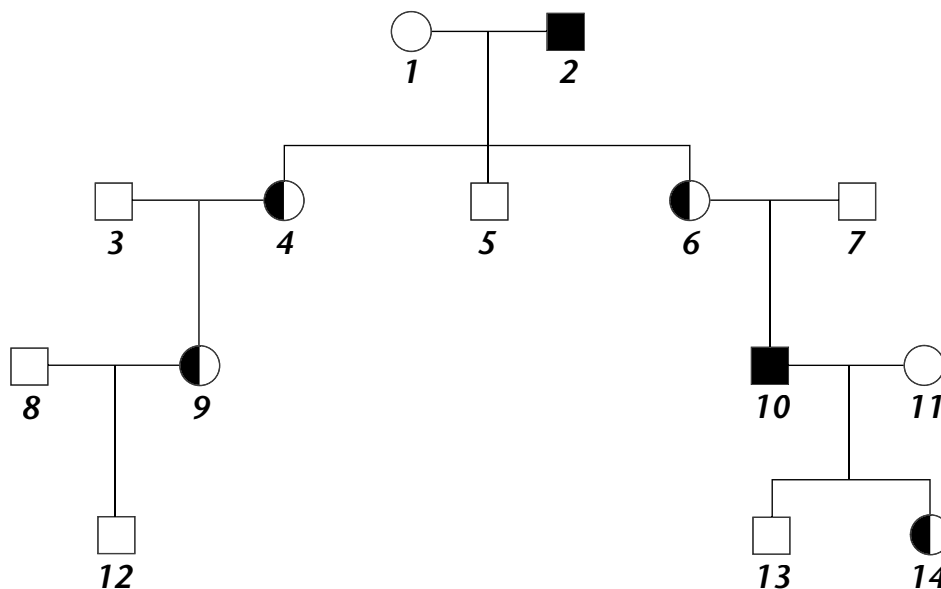
Answer each of the following questions on a separate sheet of paper.

24. What is cystic fibrosis, and what causes it?
25. Why is genetic engineering sometimes called gene splicing?

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Using Science Skills

Use the pedigree below to answer questions 26 and 27. Write your answers in the spaces provided.



26. Interpreting Data Is the pedigree shown above consistent with the pattern you might expect for a sex-linked trait controlled by a recessive allele? Explain your answer.

27. Applying Concepts Male 12 could have inherited the trait, but by chance he did not. Explain why males 5 and 13 could not have inherited the trait.

Essay

Answer each of the following questions on a separate sheet of paper.

- 28. Why can a karyotype detect Down syndrome but not hemophilia?
- 29. Explain how bacteria can be genetically engineered to produce a human protein such as insulin.
- 30. Why can't a male be a carrier of colorblindness?