

Section 14–3 Human Molecular Genetics

(pages 355–360)



Key Concepts

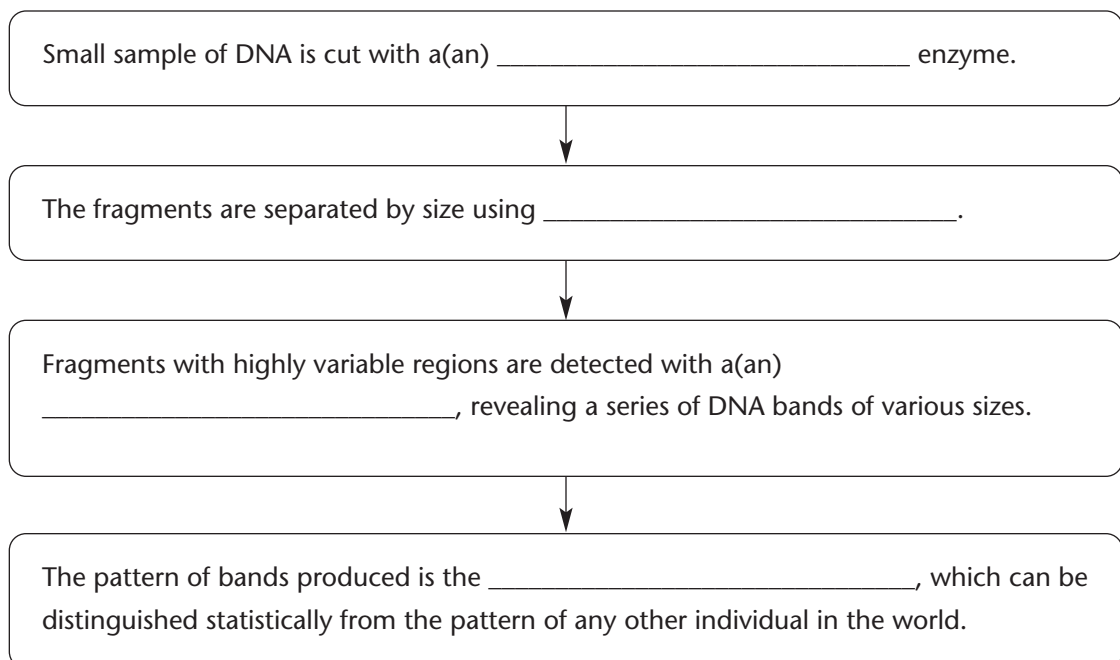
- What is the goal of the Human Genome Project?
- What is gene therapy?

Human DNA Analysis (pages 355–357)

1. Biologists search the volumes of the human genome using _____.
2. Why might prospective parents decide to have genetic testing? _____

3. Circle the letter of each sentence that is true about genetic testing.
 - a. It is impossible to test parents to find out if they are carriers for cystic fibrosis or Tay-Sachs disease.
 - b. Labeled DNA probes can be used to detect specific sequences found in disease-causing alleles.
 - c. Some genetic tests use changes in restriction enzyme cutting sites to identify disease-causing alleles.
 - d. DNA testing makes it possible to develop more effective therapy and treatment for individuals affected by genetic disease.
4. What is DNA fingerprinting? _____

5. Complete the flowchart to show the steps in DNA fingerprinting.



- 6. Circle the letter of each source for a DNA sample from an individual.
 - a. blood
 - b. sperm
 - c. clothing
 - d. hair with tissue at the base
- 7. Is the following sentence true or false? DNA evidence is not reliable enough to be used to convict criminals. _____

The Human Genome Project (pages 357–358)

- 8. What is the Human Genome Project? _____

- 9. Circle the letter of each sentence that is true about the Human Genome Project.
 - a. The human genome is the first genome entirely sequenced.
 - b. The human genome is about the same size as the genome of *E. coli*.
 - c. Researchers completed the genomes of yeast and fruit flies during the same time they sequenced the human genome.
 - d. A working copy of the human genome was completed in June 2000.
- 10. What were the three major steps in the process of sequencing the human genome?
 - a. _____

 - b. _____

 - c. _____

- 11. What is an open reading frame, and what is it used for? _____

- 12. The mRNA coding regions of most genes are interrupted by _____.
- 13. List three other parts of the gene that researchers look for.
 - a. _____
 - b. _____
 - c. _____
- 14. Why are biotechnology companies interested in genetic information? _____

15. Is the following sentence true or false? Human genome data are top secret and can be accessed only by certain people. _____

Gene Therapy (pages 359–360)

16. What is gene therapy? _____

17. Circle the letter of each sentence that is true about gene therapy.
- a. When the normal copy of the gene is inserted, the body can make the correct protein, which eliminates the disorder.
 - b. So far, no one has been successfully cured of a genetic disorder using gene therapy.
 - c. Viruses are often used to carry the normal genes into cells.
 - d. Viruses used in gene therapy often cause disease in the patients.
18. Is the following sentence true or false? All gene therapy experiments have been successful. _____

Ethical Issues in Human Genetics (page 360)

19. What other changes could be made to the human genome by manipulating human cells? _____

20. What is the responsibility of society in biology? _____

21. Is the following true or false? Scientists should be expected to make all ethical decisions regarding advances in human genetics. _____