Name____

Section 14–3 Human Molecular Genetics (pages 355–360)

TEKS FOCUS: 3C Impact of research on scientific thought and society; 3D Careers; **TEKS SUPPORT:** 6A Describe components of DNA

This section explains how genetic engineering techniques are being used to study the genes and chromosomes in the human genome. It also describes how this information is used for 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.

Small sample of DNA is cut with a(an) enzyme.
The fragments are separated by size using
) ▼
Fragments with highly variable regions are detected with a(an)
, revealing a series of DNA bands of various sizes.
The pattern of bands produced is the, which can
be distinguished statistically from the pattern of any other individual in the world.

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	Name	Class	Date
b. sperm d. hair with tissue at the base 7. Is the following sentence true or false? DNA evidence is not reliable enough to be us to convict criminals. The Human Genome Project (pages 357-358) 8. What is the Human Genome Project?	6. Circle the lette	er of each source for a DNA sample from	m an individual.
 7. Is the following sentence true or false? DNA evidence is not reliable enough to be us to convict criminals	a. blood	c. clothing	
to convict criminals	b. sperm	d. hair with tissue at the base	
 8. What is the Human Genome Project?		0	ice is not reliable enough to be used
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 a. The human genome is the first genome entirely sequenced. b. The human genome is about the same size as the genome of <i>E. coli</i>. 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		,	
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14. Why are biotechnology companies interested in genetic information?	c		
III With the biotectilionogy comparises interested in genetic information:	14. Why are biot	echnology companies interested in ger	netic information?

Nai	ne Class Date		
15.	Is the following sentence true or false? Human genome data is top secret and can be accessed only by certain people		
Ge	ne Therapy (pages 359–360)		
16.	What is gene therapy?		
17.	7. 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.	Have all gene therapy experiments been successful? Explain.		
Ed	ical Lauran Constinution		
	ical 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 goal of biology?		
01	What is the responsibility of acciety in biology?		
21.	What is the responsibility of society in biology?		
22	Is the following two on foloo? Complete should be supported to make all othics.		
22.	Is the following true or false? Scientists should be expected to make all ethical		
	decisions regarding advances in human genetics		