Class

Chapter 12 DNA and RNA

Section 12–1 DNA (pages 287–294)

TEKS FOCUS: 3E Evaluate models; 3F History of biology and contributions of scientists; 6A Components of DNA

This section tells about the experiments that helped scientists discover the relationship between genes and DNA. It also describes the chemical structure of the DNA molecule.

Griffith and Transformation (pages 287–289)

- 1. What did Frederick Griffith want to learn about bacteria?
- 2. The strain of bacteria that caused pneumonia grew into ______ colonies on culture plates; harmless bacteria produced colonies with ______ edges.
- 3. Circle the letter of each sentence that is true about Griffith's experiment.
 - a. Mice injected with bacteria from smooth colonies died.
 - b. Mice injected with bacteria from rough colonies died.
 - c. Mice injected with heat-killed bacteria from smooth colonies died.
 - **d.** Mice injected with a mixture of bacteria from heat-killed smooth colonies and live rough colonies died.
- **4.** What result from Griffith's experiment suggested that the cause of pneumonia was not a chemical poison released by the disease-causing bacteria?
- 5. What is transformation?

6. What hypothesis did Griffith form from the results of his experiments?

Avery and DNA (page 289)

- **7.** Is the following sentence true or false? Avery and his colleagues thought that the molecule required in transformation might also be the molecule of the gene.
- 8. Briefly describe how Avery and his group determined which molecule was most important for transformation?

Name	Class	Date
9. Transformation did not occu	r when	was destroyed.
10. What was the conclusion fro	m Avery's experiments?	
The Hershey-Chase Exper 11. What is a bacteriophage?	iment (pages 289–290)	
12. Circle the letter of each part	that makes up a bacteric	ophage.
a. lipid coat	c. carbohydrate core	
b. protein coat	d. DNA core	
13. What happens when a bacter	riophage infects a bacter	rial cell?
14. How would Hershey and Ch	ase learn whether gene	s were made of protein or DNA?
 15. Circle the letter of the molect marker. a. protein b. lipid 	ule for which phosphoru c. DNA d. ca	us-32 (³² P) is used as a radioactive rbohydrate
6. Is the following sentence tru	e or false? If ³⁵ S was four	nd in the bacteria, it would mean
that the viruses' DNA had be	een injected into the bac	teria.
17. What results did Hershey an	d Chase observe?	
8. Hershey and Chase conclude	ed that the genetic mater	rial of the bacteriophage was
The Components and Stru	Icture of DNA (page	s 291–294)
19. List the three critical things t a .	hat genes were known t	to do.
b		
c		
20. Adenine, guanine, cvtosine,	and thymine are four ki	nds of base

in DNA.

© Pearson Education, Inc. All rights reserved.

Guided Reading and Study Workbook/Chapter 12

- Date___
- **21.** Identify the components of a nucleotide in the diagram below. Label the bases as purines or pyrimidines.



- **22.** Is the following sentence true or false? Adenine and guanine are larger molecules than cytosine and thymine because they have two rings in their structure.
- 23. What forms the backbone of a DNA chain? _____
- **24.** Is the following sentence true or false? The nucleotides must be joined together in a specific order.
- 25. According to Chargaff's rules, the percentages of ______ are equal to thymine and the percentages of ______ are equal to guanine in the DNA molecule.
- **26.** Rosalind Franklin's work with X-ray diffraction showed that the DNA molecule is shaped like a(an) ______ and contains ______ strands.
- 27. How did Francis Crick and James Watson try to understand the structure of DNA?
- 28. How did Watson and Crick describe the structure of DNA?
- **29.** Is the following sentence true or false? According to the principle of base pairing, hydrogen bonds could form only between adenine and cytosine.

Name