



BIOLOGY REVISION SHEET FINAL EXAM

TERM-III

Session: 2017-18

CCS: 10.BIO.4 a, 5 a, 5 b.

Name:

Grade: 10

CHAPTER.8:

SECTION 8.1, SECTION 8.2, SECTION 8.3, SECTION 8.4 & SECTION 8.5.

**NOTE: THE STUDENTS SHOULD FIRST STUDY FROM THEIR TEXTBOOK
AND THEN TRY TO SOLVE THIS REVISION SHEET INDEPENDANTLY.**

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- _____ 1. Which scientist used chemical analysis to show that the genetic material in bacteria is DNA?
- Martha Chase
 - Oswald Avery
 - Frederick Griffith
 - Alfred Hershey
- _____ 2. How did Hershey and Chase's use of radiolabeled bacteriophages to study the genetic material validate Avery's research?
- It demonstrated conclusively that the genetic material is not protein.
 - It showed that bacteriophages are not digested by bacterial enzymes.
 - It proved that bacteria will take up phosphorus, but not sulfur.
 - It confirmed that bacteriophages cannot inject radiolabeled DNA.
- _____ 3. Figure 8.1 shows a single strand of DNA. Identify the nucleotide sequence of the other DNA strand.



FIG. 8.1

- GGCUTGU
 - AATGCAG
 - GGCATGA
 - TTACGTC
- _____ 4. The DNA double helix model used today is the product of research done by scientists
- Hershey and Chase.
 - Watson and Crick.
 - Pauling and Franklin.
 - Chargaff and Griffith.
- _____ 5. Suppose you can read the sequence of bases on only one strand of the double helix. What would you use to figure out the sequence on the other strand?
- central dogma
 - x-ray crystallography
 - Chargaff's rules
 - base pairing rules
- _____ 6. Which of the following is the site of DNA replication in eukaryotes?
- cytoplasm
 - ribosome
 - nucleus
 - vacuole

- _____ 7. What does DNA polymerase do during replication?
- binds nucleotides together and corrects base pair errors
 - transmits messages that are translated into proteins
 - attracts amino acids to the ribosomes for assembly
 - recognizes and points out new origins of replication
- _____ 8. Figure 8.2 shows a single strand of DNA. Identify the nucleotide sequence of the complementary RNA strand.



FIG. 8.2

- ATUTUAG
 - CAAGACT
 - AUCUCAG
 - ATCTCAG
- _____ 9. What "message" does mRNA carry?
- the genetic code that, when translated, forms proteins
 - orders for making ribosomes, a cell's protein factories
 - the order of base pairs in complementary RNA strands
 - the number of codons in an individual reading frame
- _____ 10. When does replication occur?
- once in every cell cycle
 - when nucleotides float in the nucleus
 - during the cell's M phase
 - when tRNA unzips DNA
- _____ 11. Crick's central dogma of molecular biology is essentially a summary of
- base pairing rules for all nucleotides.
 - genetic code stored in all start codons.
 - amino acid relationships to ribosomes.
 - replication, transcription, and translation.
- _____ 12. How many amino acids are coded for in the following sequence of mRNA nucleotides? Assume the reading frame begins with the first nucleotide.
- CGAUACAGUAGC**
- 3
 - 4
 - 6
 - 12

- _____ 13. When does mRNA processing take place?
- a. after replication
 - b. after translation
 - c. after transcription
 - d. after protein synthesis
- _____ 14. The nucleotide sequences that are removed during mRNA processing are called
- a. operators.
 - b. promotors.
 - c. exons.

1. What was “transformed” in Griffith’s experiment?

2. Which molecule had entered the bacterium in the Hershey-Chase experiments, sulfur or phosphorus? Which molecule is a major component of DNA?

3. What did Chargaff’s rules state?

4. What did Franklin’s data show about the three-dimensional structure of DNA?

5. What forms the backbone strands of the DNA double helix? What connects these strands in the middle?

6. Why is DNA replication described as semiconservative?

7. What are two major functions that DNA polymerase performs?

8. What is stated in the central dogma?

9. What are the three main types of RNA? Which is translated into a protein?

Parts of a DNA molecule

Overall shape:

Nitrogen-containing bases

Backbone

Pyrimidines

Purines

1.

2.

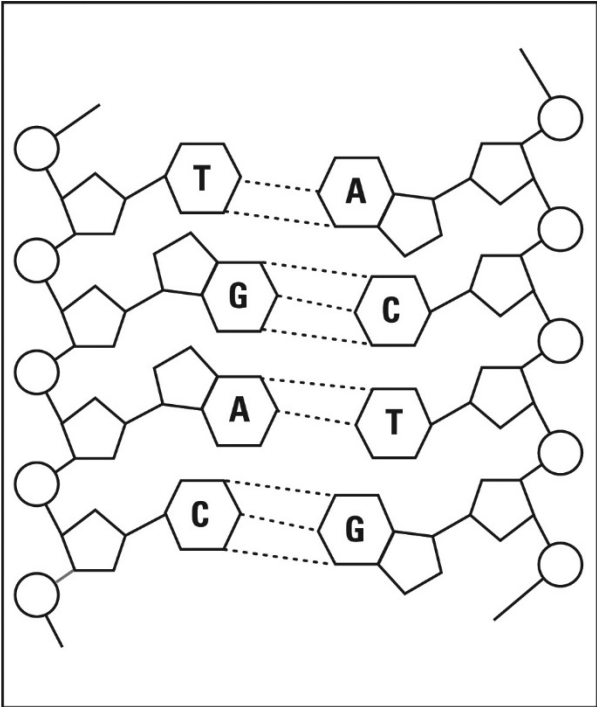
Base pairing rules:

Bonding

1.

2.

Chargaff's rules:



KEY CONCEPT

DNA replication copies the genetic information of a cell.

VOCABULARY

replication	DNA polymerase
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MAIN IDEA: Replication copies the genetic information.

1. What is DNA replication?

2. Where does DNA replication take place in a eukaryotic cell?

3. When is DNA replicated during the cell cycle?

4. Why does DNA replication need to occur?

5. What is a template?

6. If one strand of DNA had the sequence TAGGTAC, what would be the sequence of the complementary DNA strand?

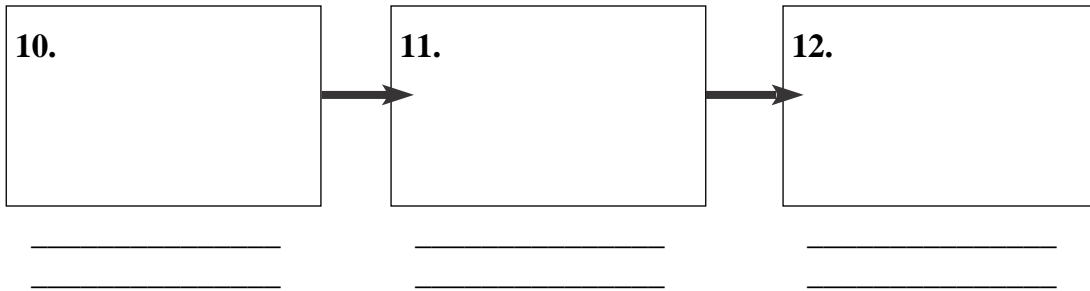
MAIN IDEA: Proteins carry out the process of replication.

7. What roles do proteins play in DNA replication?

8. What must be broken for the DNA strand to separate?

9. Why is DNA replication called semiconservative?

Use words and diagrams to summarize the steps of replication, in order, in the



boxes below.

MAIN IDEA: REPLICATION IS FAST AND ACCURATE.

13. Human chromosomes have hundreds of _____, where the DNA is unzipped so replication can begin.

14. DNA polymerase has a _____ function that enables it to detect errors and correct them.

Vocabulary Check

15. Explain what DNA polymerase is by breaking the word into its parts.

16. Write a short analogy to explain what replication is.

Be Creative

17. People sometimes like to display bumper stickers that relate to their trade or field of study. For example, a chemist may have a bumper sticker that says “It takes alkynes to make the world.” Then, chemists or other people who know that an alkyne is a molecule that contains carbon atoms joined by a triple bond get a nice little chuckle out of the play on words. Use your knowledge of DNA replication to write a bumper sticker.

KEY CONCEPT

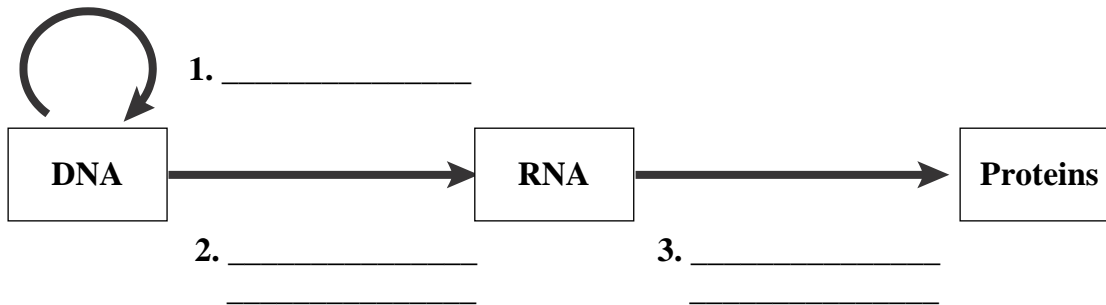
Transcription converts a gene into a single-stranded RNA molecule.

VOCABULARY

central dogma	messenger RNA (mRNA)
RNA	ribosomal RNA (rRNA)
transcription	transfer RNA (tRNA)
RNA polymerase	

MAIN IDEA: RNA carries DNA's instructions.

Label each of the processes represented by the arrows in the diagram below. Write where each of these processes takes place in a eukaryotic cell in parentheses.



Fill in the table below to contrast DNA and RNA.

DNA	RNA
4. Contains the sugar deoxyribose	
5.	Has the bases A, C, G, and U
6. Typically double-stranded	

MAIN IDEA: Transcription makes three types of RNA.

7. What enzyme helps a cell to make a strand of RNA?

8. Summarize the three key steps of transcription.

9. Write the basic function of each type of RNA in the chart below.

Type of RNA	Function
mRNA	
rRNA	
tRNA	

MAIN IDEA: The transcription process is similar to replication.

10. List two ways that the processes of transcription and replication are similar.

11. List two ways that the end results of transcription and replication differ.

Vocabulary Check

12. How does the name of each type of RNA tell what it does?

13. What is transcription?

KEY CONCEPT

Translation converts an mRNA message into a polypeptide, or protein.

VOCABULARY

translation	stop codon	anticodon
codon	start codon	

MAIN IDEA: Amino acids are coded by mRNA base sequences.

1. What is translation?

2. What is a codon?

3. Would the codons in Figure 5.1 be found in a strand of DNA or RNA?

4. What is a reading frame?

Refer to Figure 5.1 to complete the table below.

Codon	Amino Acid or Function
5. AGA	
6. UAG	
7.	tryptophan (Trp)
8. GGA	

MAIN IDEA: Amino acids are linked to become a protein.

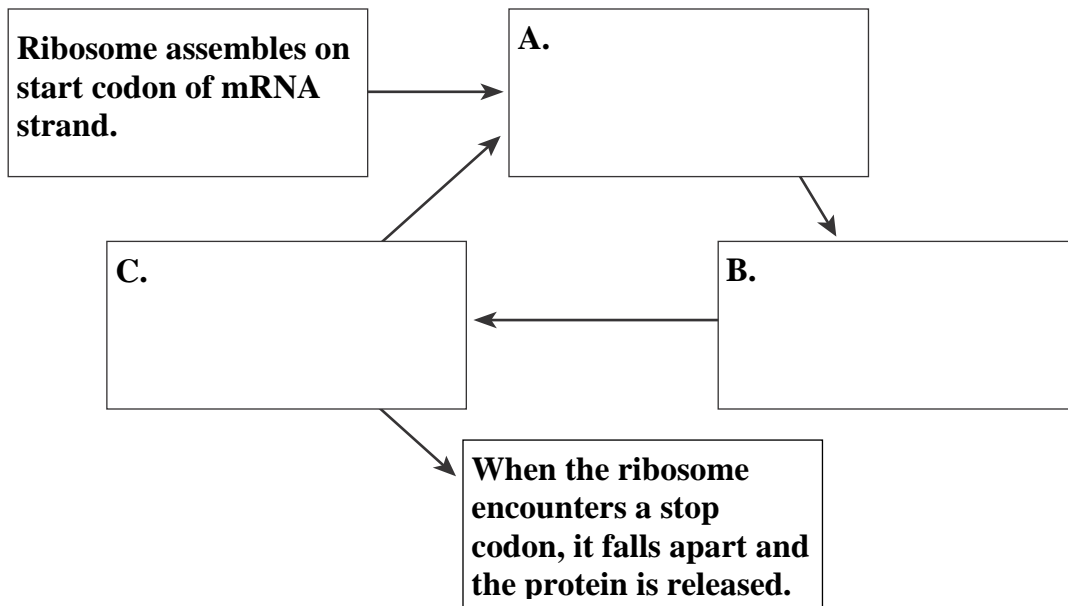
9. _____ and _____ are the tools that help a cell translate an mRNA message into a polypeptide.

10. The _____ subunit of a ribosome holds onto the mRNA strand.

11. The _____ subunit of a ribosome has binding sites for tRNA.

12. A tRNA molecule is attached to an _____ at one end and has an _____ at the other end.

Fill in the cycle diagram below to outline the steps of translation.



Vocabulary Check

13. What are AGG, GCA, and GUU examples of?

14. What is a set of three nucleotides on a tRNA molecule that is complementary to an mRNA codon?

15. What do codons code for in addition to amino acids?

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