

Key Concept Builder 

LESSON 3

DNA and Genetics

Key Concept What is DNA?

Directions: *On the line before each statement, write T if the statement is true or F if the statement is false.*

- _____ 1. Genetic information is encoded in a molecule called DNA.

- _____ 2. This molecule is shaped like a twisted ladder, a shape that is called a triple helix.

- _____ 3. James Watson and Francis Crick discovered the structure of this molecule after studying gamma-ray images of the molecule.

- _____ 4. The sides of the ladder are made from joined molecules called bases.

- _____ 5. The combination of a nitrogen base, a sugar, and a phosphate group is a unit called a gene.

- _____ 6. The base guanine always joins with the base cytosine.

- _____ 7. An organism's genes are located in cell structures called chromosomes.

- _____ 8. The process by which the molecule of heredity makes copies of itself is called transcription.

- _____ 9. Most genes encode information for the production of proteins.

Directions: *Answer the question on the lines provided.*

10. How does DNA replicate itself?

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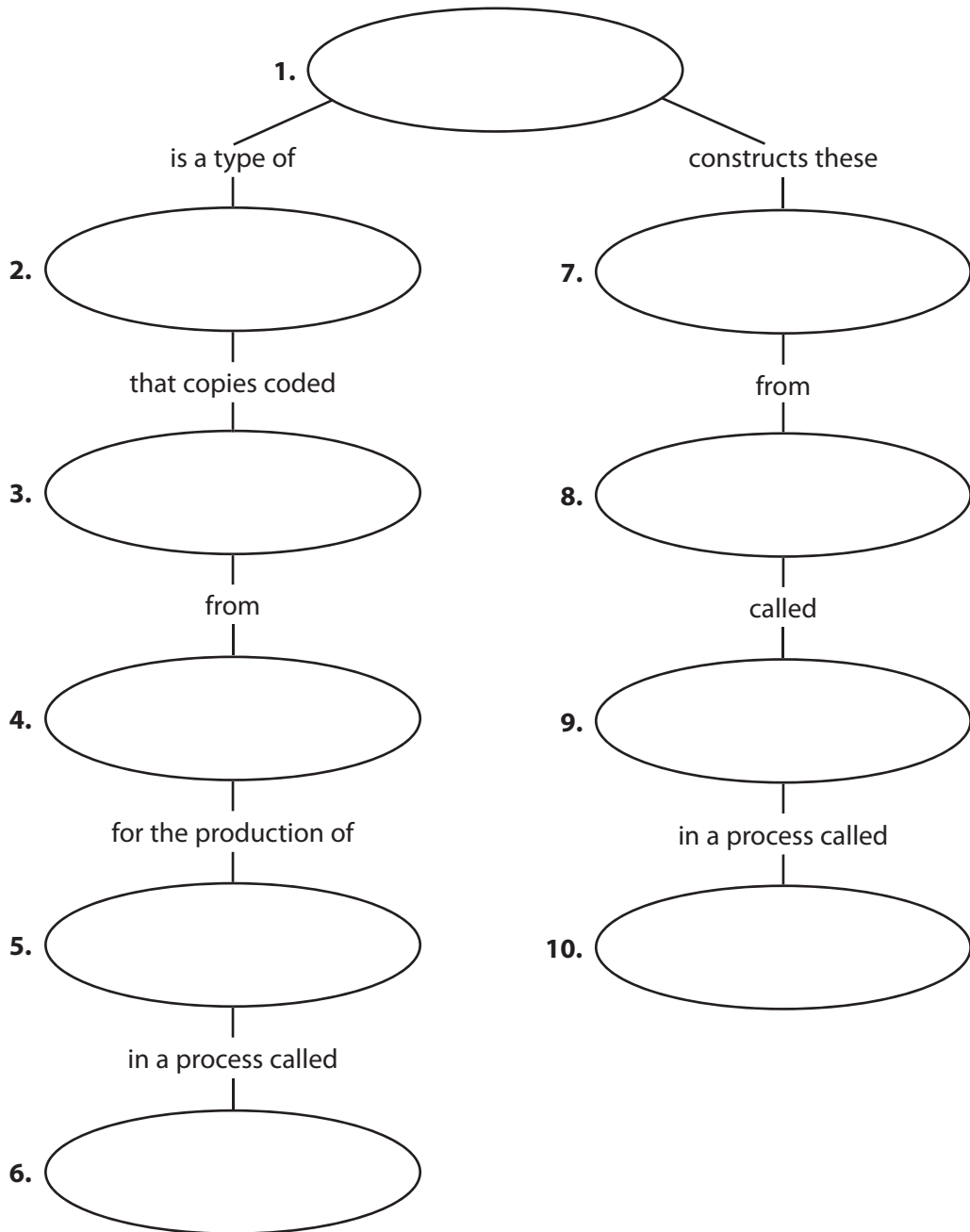
LESSON 3

DNA and Genetics

Key Concept What is the role of RNA in protein production?

Directions: Complete this concept map by choosing terms from the word bank and writing them in the correct spaces.

- | | | | | |
|--------------------|------------|----------------------|--------------------|---------------------|
| amino acids | DNA | instructions | molecules | nucleic acid |
| proteins | RNA | transcription | translation | units |



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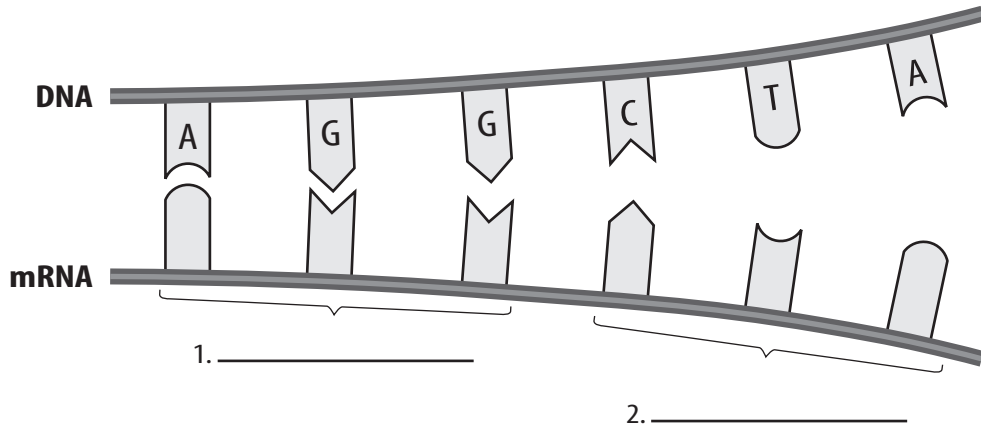
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Key Concept What is the role of RNA in protein production?

Directions: The diagram below shows one strand of a DNA molecule with six bases shown. A strand of mRNA has just been created from those bases that will be used to make part of a protein. Write the letters of the corresponding RNA bases on each line provided. (Remember that in RNA, U takes the place of T.)



Directions: Answer each question on the lines provided.

3. Which structures in the cell are proteins assembled in?

4. What component of a cell are these structures attached to?

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LESSON 3

DNA and Genetics

Key Concept How do changes in the sequence of DNA affect traits?

Directions: Answer each question on the lines provided.

1. How many human chromosomes are there?

2. Approximately how many human genes are there?

3. What is a mutation?

4. Which four causes of mutations are discussed in the lesson?

5. Which two genetic disorders are caused by mutations that are mentioned in the lesson?
