Key

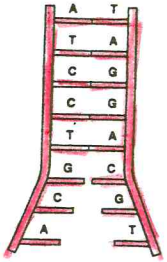
DNA Replication Practice (p. 200-202 in textbook)

Directions: Below are the 3 steps in DNA replication. Follow the directions for each step and then answer the questions below.

1. Color the **DNA molecule red.**

-What does the diagram to the right show happening to the DNA molecule? (Explain the first step in DNA replication)

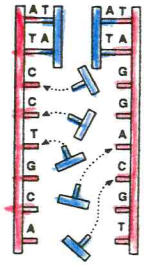
Helicase enzyme unzips the DNA



2. Color the **original strand of DNA red.** Color the **new strand** (nucleotides being added) **blue.**

-What happens to the DNA molecule during the second step of DNA replication?

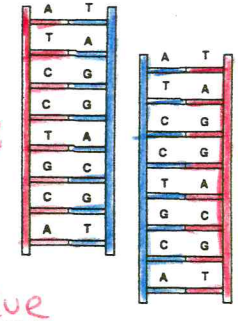
Polymerase enzymes add complementary nucleotides to build the new strands.



3. -Color the **old DNA strands red** and color the **new DNA strands blue.**

-What happens during the third step of DNA replication?

Polymerase finishes building 2 new identical strands. Each ½ old, ½ new (semi-conservative)



-Which color, red or blue, represents the original strand? red Which color represents the new strand? blue

How DNA Is Copied

* Hydrogen bonds connect the bases

4. What does it mean that the two strands of DNA are complementary?

The base pairs connect A-T, C-G

5. What is **DNA replication?** Copying DNA

6. Using your book (p.200), place the steps of DNA replication in the correct order.

2 a. The enzyme DNA polymerase moves along the exposed strands and adds complementary nucleotides to each nucleotide in each existing strand.

1 b. The DNA double helix breaks or unzips down the middle between the base pairs.

3 c. A complementary strand is created for each of the two strands of the original double helix.

4 d. Two new identical DNA molecules have been produced.

7. (True or False) The process of DNA replication results in an exact copy of the original DNA molecule.

8. (True or False) Sugars and phosphates break off from the DNA nucleotide to provide energy for DNA replication.

9. (True or False) DNA does not have to break apart to be copied.

10. (True or False) After DNA replication is complete, there are two DNA molecules; each has half old (original) DNA and half new DNA. Semi-conservative

11. Where does DNA replication happen? nucleus

12. When does DNA replication happen? Interphase (S-phase)

13. Below are DNA strands. Make the complementary DNA strand: * A-T, C-G

Original Strand: A T G C A A A T T G C T C A C C G G G G A T C A G C A C C G G

Complementary Strand: T A C G T T T A A C G A G T G G C C C C T A G T C G T G G

14. Below are DNA strands. Make the complementary DNA strand:

Original Strand: A G G G G A T C A G C A C C G G A T T T C A T G A G C C C T A

Complementary Strand: T C C C C T A G T C G T G G C C T A A A G T A C T C G G G A T

15. Below are DNA strands. Make the complementary DNA strand:

Original Strand: A T T T G C G A C C G T T A A G G C C G T A C G C A T G A C T

Complementary Strand: T A A A C G C T G G C A A T T C C G G C A T G C G T A C T G A