1. What are the five bases that make up nucleotides? Group them is terms of DNA only, RNA only, or DNA and RNA.

1. The sugar in DNA is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ while the sugar in RNA is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. What are the components of a nucleotide? What are the components of a nucleoside?
   1. Nucleotide-
   2. Nucleoside-
3. How are nucleosides named?
4. Describe the linkage between nucleotides.
5. In the primary structure of nucleic acids, the nucleic acid backbone is a \_\_\_\_\_\_\_\_.
   1. Phosphate-base repeat
   2. Phosphate-sugar repeat
   3. Sugar-base repeat
   4. A protein
6. Nucleic acids are named as the \_\_\_\_\_\_\_\_\_\_\_, starting at the free \_\_\_\_\_ end and ending at the free \_\_\_\_\_ end.
   1. Bases , 3’ , 5’
   2. Bases , 5’ , 3’
   3. Nucleotides , 3’, 5’
   4. Nucleotides , 5’ , 3’
   5. Nucleosides , 5’, 3’
7. If a phosphate is added to the nucleoside monophosphate, what forms?
8. If a phosphate is added to the nucleoside diphosphate, what forms?

**Write the type of bond that is between each of the following pairs in DNA.**

1. Phosphate and sugar = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Base and base = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Sugar and base = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Write complementary DNA and RNA strands to:**

Given: 5’-A-T-C-G-G-C-T-T-A-C-3’

1. DNA: 3’-
2. RNA: 3’-

Now, next to 4 and 5, write the sequence in the 5’-3’ direction. This is how they are typically written.

**DNA replication allows for the transfer of genetic information to new cells. The goal is to make exact copies of an existing parent DNA double strand. There are two ways to do this; define each:**

1. Conservative Replication-
2. Semi-Conservative Replication-

**Answer the following questions.**

1. Where does DNA replication occur?
2. How does DNA replication occur?
3. What is the process in which the DNA sequence is copied to an mRNA sequence?
4. What is the process in which the mRNA code is converted into a protein/ amino acid sequence/ peptide chain?
5. **Transcription: Write the peptide coded for the following mRNA strand:**

5’-AUG-UCU-AAU-CGU-GCU-GAU-UCG-GGU-GCA-UAG-3’

1. Write the peptide coded if U6 is replaced by a C and if G23 is replaced by a U.