DNA Base Pairing Worksheet

There are base pairing rules for writing complimentary DNA strands for a given strand.

- A pairs with T
- C pairs with G

In RNA, A pairs with U, instead of T.

Write the complimentary DNA strand for each given strand of DNA.

1. CGTAAGCGCTAATTA
2. TCTTAAATGATCGATC
3. AATGAATAGCTAGCTT
4. GGCATTCGCGATCATG
5. CGTTAGCATGCTTCAT
6. ACTAACGGTAGCTAGC

Now write the mRNA strand for the given DNA strand.

7. ATGTCGCTGATACTGT
8. GAAGCGATCAGTTACG
9. AATGAATAGCTAGCTT
10. GGCATTCGCGATCATG
11. CGTTAGCATGCTTCAT
12. ACTAACGGTAGCTAGC
Write the tRNA sequence for the given strand of mRNA
13. AGGUCAUGCAUGGGCAUGCAU

14. AGAGAUUCCAGCUAGCAGGAUA

15. GUCAUCAUGCAUCGGAUGCC

16. UUUCAGUCAGCUAGCGAUCGU

Now you will translate the amino acid sequence for the given mRNA strand. Remember that codons are 3 base pairs long.

17. AUG CAC UGU CCU UUC GCU GAC

18. GAG AUC UGG UUG GAA UCG

19. AGC GUA UUA ACG UAU CAU

20. AGU CGA UCG AUG CGG AUG AUA

21. GUC GUC GAU AGC UAG CAU GCA

Transcribe the following DNA strand. Then translate the mRNA strand you wrote.

22. TAAAGTCGACTAGCTGACCGTAGAC

23. CTTGGCTTTATAATAGTTGCCTCGC
The following are pieces of mRNA. Give the DNA strand from which it was transcribed.

24. GAGAUCUGGUUGGAAUCG

25. AGCGUAUUAAACGUAUCAU

Complete the table below showing the sequences of DNA, mRNA codons, tRNA anticodons and the amino acids. Remember the genetic code is based on mRNA codons.

<table>
<thead>
<tr>
<th>First letter</th>
<th>Second letter</th>
<th>DNA</th>
<th>mRNA codon</th>
<th>tRNA anticodon</th>
<th>Amino Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>U</td>
<td>1.</td>
<td>2.</td>
<td>GAT</td>
<td>3.</td>
</tr>
<tr>
<td>C</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>U</td>
<td>4.</td>
<td>5.</td>
<td>UAG</td>
<td>6.</td>
</tr>
<tr>
<td>U</td>
<td>C</td>
<td>7.</td>
<td>8.</td>
<td>AUG</td>
<td>9.</td>
</tr>
<tr>
<td>U</td>
<td>G</td>
<td>10.</td>
<td>11.</td>
<td></td>
<td>12.</td>
</tr>
<tr>
<td>U</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>C</td>
<td></td>
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</tr>
<tr>
<td>G</td>
<td>G</td>
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</tr>
</tbody>
</table>

Complete t

<table>
<thead>
<tr>
<th>DNA</th>
<th>1.</th>
<th>2.</th>
<th>GAT</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA codon</td>
<td>4.</td>
<td>5.</td>
<td>6.</td>
<td>UAU</td>
</tr>
<tr>
<td>tRNA anticodon</td>
<td>7.</td>
<td>UUC</td>
<td>8.</td>
<td>9.</td>
</tr>
<tr>
<td>Amino Acid</td>
<td>Tryptophan</td>
<td>10.</td>
<td>11.</td>
<td>12.</td>
</tr>
</tbody>
</table>
1. Using the following piece of DNA, give the mRNA molecule and the amino acid sequence for which it codes.

DNA- A T A T A A A C G A G G A A A T T C C G G G C G
mRNA
Amino acids:

2. Use the mRNA sequence to find the DNA sequence and the amino acid sequence.

DNA
mRNA- A U G C C U A C A U G U G G U G U A A C C U U A
Amino acids

For each codon below, give the tRNA anticodon.

3. UUC _______ 4. AUC _______
5. CCG _______ 6. CGU _______

7. Give all the possible codons for the amino acids listed below. (Use page 211 in your text).

Histidine (His) ___________________________________________
Isoleucine (Ile) ___________________________________________
Arginine (Arg) ___________________________________________
Tryptophan (Trp) _________________________________________