DNA Replication & Protein Synthesis

Word Bank

<table>
<thead>
<tr>
<th>thymine</th>
<th>replication</th>
<th>cytosine</th>
</tr>
</thead>
<tbody>
<tr>
<td>phosphate group</td>
<td>proteins</td>
<td>identical</td>
</tr>
<tr>
<td>double helix</td>
<td>uracil</td>
<td>nitrogen base</td>
</tr>
<tr>
<td>two</td>
<td>deoxyribose sugar</td>
<td>hydrogen bonds</td>
</tr>
<tr>
<td>adenine</td>
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</tbody>
</table>

1. The double coiled shape of DNA is called a _______________ _______________.

2. In order for DNA to begin replication _______________ _______________ between nitrogen bases must break.

3. DNA has ________ strands.

4. DNA nucleotides consist of 3 parts:
   a. _______________ _______________
   b. _______________ _______________ &
   c. _______________ _______________

5. Nitrogen bases in the DNA sequence code for__________________________.

6. The end result of DNA replication is two _______________ double helixes.

7. In DNA, the nitrogen bases are: adenine; cytosine, guanine & _________________.

8. In RNA, the nitrogen bases are: adenine; cytosine, guanine & _________________.

9. _________________ is the DNA process that produces a new copy of an organism’s genetic information to pass on to a new cell.

10. Thymine forms a hydrogen bond with __________________________ and guanine forms a hydrogen bond with _________________________.

(To find answers refer your notes & textbook)

Period: __________

Name: ____________________
Label the diagram of DNA replication. Use the following word bank:

- base pair
- phosphate
- deoxyribose
- hydrogen bonds
- nucleotide
- nitrogen base
17. The diagram below shows one side of an unzipped strand of DNA (replication). Write the letters - A, T, C, or G - of the bases that will pair with the bases on the strand. Some of the bases have been paired for you.

18. Write the complementary strand for the following DNA sequence (replication).

\[
\begin{align*}
T & \quad A & \quad C & \quad G & \quad C & \quad A & \quad T & \quad T & \quad A & \quad C & \quad G & \quad C & \quad T & \quad A & \quad T & \quad G & \quad C & \quad A & \quad T & \quad C \\
\end{align*}
\]

19. Adenine (A), cytosine (C), guanine (G), and _____________ are the nitrogen bases found in RNA.

20. RNA has ______ strands.
   a. 4
   b. 3
   c. 1
   d. 2

21. RNA nucleotides consist of
   a. a nitrogen base only
   b. a phosphate group, ribose sugar, and a nitrogen base
   c. a ribose sugar and phosphate group
   d. ribose sugar and hydrogen base

22. In RNA, which of the nitrogen bases does not belong?
   a. guanine
   b. uracil
   c. thymine
   d. adenine
Complete the following chart on the 3 chemical differences between DNA and RNA.

<table>
<thead>
<tr>
<th>Structure</th>
<th>DNA</th>
<th>RNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Number of strand(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Name of Sugar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Names of the 4 nitrogen bases</td>
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</tr>
</tbody>
</table>

26. Turning DNA into RNA is called:
   a. replication
   b. transcription
   c. translation
   d. mutation

27. Which of the following transcriptions is correct?
   A. TACGACTAGATC
      UUGCUGUUCUUG
   B. TACGACTAGATC
      ATGCTGATCTAG
   C. TACGACTAGATC
      CGTACGTACCGA
   D. TACGACTAGATC
      AUGCUAGAUCAUG

28. A codon is
   a. a series of 3 nitrogen bases that code for an amino acid
   b. a series of 4 nitrogen bases that code for an amino acid
   c. a character on the TV series Star Trek
   d. when you put your coat on

29. Which type of RNA leaves the ribosome in search of nucleotides in the cytoplasm and brings them back to the ribosome for protein synthesis?
   a. tRNA
   b. rRNA
   c. mRNA
   d. zRNA
30. The 3 nucleotides that tRNA find and bring back to the ribosome are called the ______-codon.

31. The anti-codon and codon bond together by peptide bonds and form long chains of ______ ______.

Matching.
Use the key terms and match them with their definition.

a. transcription (p.
b. translation
c. tRNA
d. mRNA
e. codon

32. This is a set of 3 nitrogen bases used to make amino acids.

33. This happens when mRNA uses a copied DNA code to make protein.

34. This brings amino acids to ribosomes.

35. This carries the copied DNA code out to the cytoplasm.

36. This happens when RNA unzips from the DNA code.

37. A mutation is any mistake or change in the
   a. RNA sequence
   b. DNA sequence
   c. Ribosomes
   d. Nucleus

38. After breaking away from the original strand of DNA during transcription, RNA becomes which type of RNA?
   a. tRNA
   b. mRNA
   c. rRNA
   d. zRNA

39. The codons of 3 nitrogen bases in the mRNA strand codes for what?
   a. amino acids
   b. sugars
   c. fats
   d. dairy
40. List the 3 different types of codons that code for stops. (HINT: if you don't know, use your codon chart on p. 303).
____________
____________
____________

41. When mRNA leaves the nucleus, where does it go? ____________________

On the codon chart, find the following codons and give the amino acid that the codon codes for:

42. GCU codes for: ____________________
43. AUG codes for: ____________________ or it can act as a start codon.
44. UCU codes for: ____________________

45. How many stop codons are there on the codon chart? ______

46. Translation is the process of using mRNA to make
   a. DNA
   b. Fats
   c. RNA
   d. Amino acids

**Compare & Contrast DNA & RNA**

<table>
<thead>
<tr>
<th></th>
<th>DNA Only</th>
<th>Both DNA &amp; RNA</th>
<th>RNA Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is called a nucleic acid</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Contains Uracil</td>
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<td></td>
<td></td>
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<tr>
<td>Found in the nucleus</td>
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<td></td>
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<tr>
<td>Contains Thymine</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Contains Adenine, Guanine and Cytosine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contains one strand of nucleotides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pairs A-U, T-A, G-C &amp; C-G</td>
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<td></td>
</tr>
<tr>
<td>Pairs A-T, T-A, G-C &amp; C-G</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Contains two strands of nucleotides</td>
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</tbody>
</table>

Contains Thymine

Pairs A-U, T-A, G-C & C-G

Contains two strands of nucleotides