

Protein Synthesis Worksheet

1. In DNA, adenine binds with _____ and guanine binds with _____.
2. In RNA, adenine binds with _____ and guanine binds with _____.
3. Transcription takes place in the _____; translation takes place in the _____.
4. The building blocks of nucleic acids are _____.
5. When the DNA “cookbook” unzips, a complete protein “recipe” called a _____ is exposed.
6. At that time, a complementary copy of that “recipe” is made. Scientifically stated, _____-RNA is formed from RNA _____, in a process called _____.
7. When this “string” of RNA leaves the nucleus through a nuclear pore, it goes into the cytoplasm and binds to another player, _____-RNA (the “site of protein synthesis”).
8. The _____-RNA “recipe” is “read” and a protein is assembled in a process called _____.
9. The building blocks of proteins are _____, so another form of RNA is necessary to deliver those building blocks to the site of protein synthesis. This is _____RNA.
10. The 3 nitrogen bases of DNA are called _____; the 3 nitrogen bases of _____ are called anticodons; the 3 nitrogen bases of _____ are called codons.
11. All of the above steps take place during what PHASE of the cell cycle? _____
12. Know these steps in order, and be sure to learn the associated vocabulary.
13. Chromatin is _____.
14. A chromosome is _____.
15. A gene is _____.
16. The genome is _____.
17. Using the **tRNA** Dictionary below, do transcription and translation to build the protein sentence on the next page.

| Anti-codon | AA sym | AA abr | Anti-codon | AA sym | AA abr | Anti-codon | AA sym | AA abr | Anti-codon | AA sym | AA abr |
|------------|--------|--------|------------|--------|--------|------------|--------|--------|------------|--------|--------|
| CGA | A | ala | GUA | H | his | GGA | P | pro | UCA | S | ser |
| CGC | A | ala | GUG | H | his | GGC | P | pro | UCG | S | ser |
| CGG | A | ala | UAA | I | iso | GGG | P | pro | UGA | T | thr |
| CGU | A | ala | UAG | I | iso | GGU | P | pro | UGC | T | thr |
| ACA | C | cys | UAU | I | iso | GUC | Q | glu | UGG | T | thr |
| ACG | C | cys | UUC | K | lys | GUU | Q | glu | UGU | T | thr |
| CUA | D | asp | UUU | K | lys | GCA | R | arg | CAA | V | val |
| CUG | D | asp | AAC | L | leu | GCC | R | arg | CAC | V | val |
| CUC | E | glu | AAU | L | leu | GCG | R | arg | CAG | V | val |
| CUU | E | glu | GAA | L | leu | GCU | R | arg | CAU | V | val |
| AAA | F | phe | GAC | L | leu | UCC | R | arg | ACC | W | trp |
| AAG | F | phe | GAG | L | leu | UCU | R | arg | AUA | Y | tyr |
| CCA | G | gly | GAU | L | leu | AGA | S | ser | AUG | Y | tyr |
| CCC | G | gly | UAC | M | meU | AGC | S | ser | ACU | - | space |
| CCG | G | gly | UUA | N | asn | AGG | S | ser | AUC | - | space |
| CCU | G | gly | UUG | N | asn | AGU | S | ser | AUU | - | space |