

Transcription and Translation Activity Follow Up Questions



1. In what ways do the chemical structures of DNA and RNA differ?

DNA - double strand, deoxyribose sugar, contains thymine (T)

RNA - single strand, ribose sugar, contains uracil (U)

2. What is a codon and what does it represent?

A codon is a sequence of three DNA or RNA nucleotides that corresponds with a specific amino acid or stop signal during protein synthesis.

3. What is an anticodon?

An anticodon is a sequence of 3 nucleotides complementary to that of a corresponding codon in a messenger RNA (mRNA) sequence. An anticodon is found at one end of a transfer RNA (tRNA) molecule.

4. Compare and contrast the final products of DNA replication and transcription.

Replication makes DNA, Transcription makes mRNA, both make in the nucleus

5. You have learned that there is a stop codon that signals the end of an amino acid chain. Why is it important that a signal to stop translation be part of protein synthesis?

Polypeptides need to have an ending point so they can be released from ribosome and can form 3D structure needed to be a functioning protein or enzyme

6. Why does a cell need to carry out transcription before translation?

Transcription makes mRNA that can exit the nucleus & enter cytoplasm where translation occurs, leaving the DNA protected inside.

7. Explain how a gene directs the synthesis of a protein, Include in your explanation the words amino acid, anti-codon, codon, cytoplasm, DNA, mRNA, nucleotide, nucleus, protein, ribosome, RNA polymerase, tRNA, transcription, translation, 5' cap, and poly-A tail.

answers will vary

8. In the cell how could a single changed base in mRNA affect the synthesis of proteins?

If the change is in the 1st or 2nd position of a codon it will code for another amino acid, this can then change how a protein forms its secondary & tertiary structures.

9. Describe the function of each of the following in protein synthesis: rRNA, mRNA and tRNA.

rRNA - builds ribosomes, mRNA - carries genetic information out of the nucleus,

tRNA - carries amino acids to make polypeptide based on codon sequence in mRNA

10. Considering that we are all made up of the same 4 nucleotides in our DNA, and the same 4 nucleotides in our RNA, and the same 20 amino acids in our proteins, why are we so different from each other?

There are many ways they can be combined

The genome is very long, average length of 1 gene is 8500 base pairs.

Amino acids interact with each other differently based on their sequence & environment.

11. Why does it make sense to use the word translation to describe protein synthesis?

Going from "language" of nucleotides to one of amino acids

12. Why would it not make sense to use the word translation to describe mRNA synthesis?

Still using same language of nucleotides