Transcription

RNA, Ribonucleic Acid is very similar to DNA. RNA normally exists as a single strand (and not the double stranded double helix of DNA). It contains the same bases, adenine, guanine and cytosine. However, there is no thymine found in RNA, instead there is a similar compound called uracil. Also the sugar in RNA is different from DNA. Ribose is the RNA sugar while deoxyribose is the sugar in DNA.

Transcription is the process by which RNA is made from DNA. It occurs in the nucleus. Label the box with the x in it near the nucleus with the word TRANSCRIPTION and proceed to color the bases according to the key below.

- Thymine = orange
- Adenine = dark green
- Guanine = purple
- Cytosine = yellow
- Uracil = brown

Color the strands of DNA light blue (D) and the strand of mRNA dark blue (R). Color the nuclear membrane (E) black.

Translation

Translation occurs in the cytoplasm, specifically on the ribosomes. The mRNA made in the nucleus travels out of the nucleus through nuclear pores into the cytoplasm and the ribosome so that the "message" of the DNA can be carried out. Here at the ribosome, the message will be translated into an amino acid sequence. Color the ribosome light green (Y) and note how the mRNA strand threads through the ribosome like a tape measure and the amino acids are assembled. The mRNA strand in the translation area should also be colored light blue, as it was colored in the nucleus.

Important to the process of translation is another type of RNA called Transfer RNA (F) which functions to carry the amino acids to the site of protein synthesis on the ribosome. Color the tRNA red.

A tRNA has two important areas. 1) The anticodon, which matches the codon on the mRNA strand and 2) the amino acid located on top of the tRNA. Remember that codons are sets of three bases that code for a single amino acid. Make sure you color the bases of the anticodon the same color as the bases on your DNA and mRNA strand - they are the same molecules!

At the top of the tRNA is the amino acid. There are twenty amino acids that can combine together to form proteins of all kinds, these are the proteins that are used in life processes. When you digest your food for instance, you are using enzymes that were originally proteins that were assembled from amino acids. Each tRNA has a different amino acid which link together like box cars on a train. Color all the amino acids (M) pink.

Questions:

1. How many different kinds of bases can be found on DNA ______
2. What base is found on RNA but not on DNA? _____________
3. How many bases are in a codon? ______  In an anticodon? _____________
4. How many amino acids are attached to a single transfer RNA? ______
5. Transcription occurs in the ________; translation occurs in the ____________.
6. The process of making RNA from DNA is called ____________________ and it occurs in the ________________
7. The process of assembling a protein from RNA is called __________________ and it occurs in the ________________