Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_\_\_\_\_

From DNA to Protein

<http://learn.genetics.utah.edu/content/begin/tour/>

# What is DNA?

•DNA is a set of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

•DNA is in a twisted ladder shape called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

•The sides of the ladder are made of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_backbone.

•In DNA, \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ are always paired together and \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ are always paired together.

•DNA is made of letters. The letters make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ made of \_\_\_\_\_\_\_ letters.

•The DNA words make sentences called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

# What is a gene?

•Genes are directions for making \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•There are about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ genes in human DNA.

•There is a gene for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is a protein used for carrying oxygen in red blood

cells. If this gene is mutated, it can cause a disorder known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

# What is a chromosome?

•There is about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of DNA in each cell in your body.

•The DNA is packaged into units called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•The shape of DNA called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ helps package the DNA. Then the DNA is wrapped

around some \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These proteins are packaged together to form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•Each human cell has \_\_\_\_\_\_\_\_ chromosomes, or \_\_\_\_\_\_\_\_\_\_ pairs (one set from each parent).

•Males have \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ chromosomes. Females have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chromosomes.

•Compared to humans’ 46 chromosomes, onions have \_\_\_\_\_\_\_\_\_, mosquitoes have \_\_\_\_\_\_\_\_\_, and carp

have \_\_\_\_\_\_\_\_.

# What is a protein?

•Our bodies are made of 100 trillion cells and each cell has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of proteins, each one with a different job.

•One kind of protein is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ protein on nerve cells that transmit signals.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ proteins give cells their shape.

<http://www.wisc-online.com/objects/ViewObject.aspx?ID=ap1302>

# Protein synthesis

•The cell gets a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make a specific \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•A part of the DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where there is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make the protein.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move along the DNA to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is called **Transcription. (The DNA code is transcribed or copied into RNA.)**

•In RNA, \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ are paired together and \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ are paired together.

•Many copies of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are made and leave the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ binds with a ribosome where it is decoded. Since this is where the DNA language is changed to the protein language, this is called **Translation.**

•The code on the m-RNA is read \_\_\_\_\_\_\_ bases at a time. This is called a triplet code or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•Each codon stands for a different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has two ends. One has a binding site for a specific

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The other is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that binds with a specific codon.

•The appropriate t-RNA attaches to and carries the activated amino acid to the ribosome. Anticodon bases pair with codon in order to bring specific amino acids to the correct place. Draw this happening below (page 9 of animation): *(label the m-RNA, t-RNA, and ribosome.)*

•After another t-RNA brings a second amino acid, the two amino acids form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•Another t-RNA brings another amino acid. The previous amino acids \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and form more peptide bonds.

•More and more amino acids are linked together to form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

•When the protein is made, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is broken down and recycled.