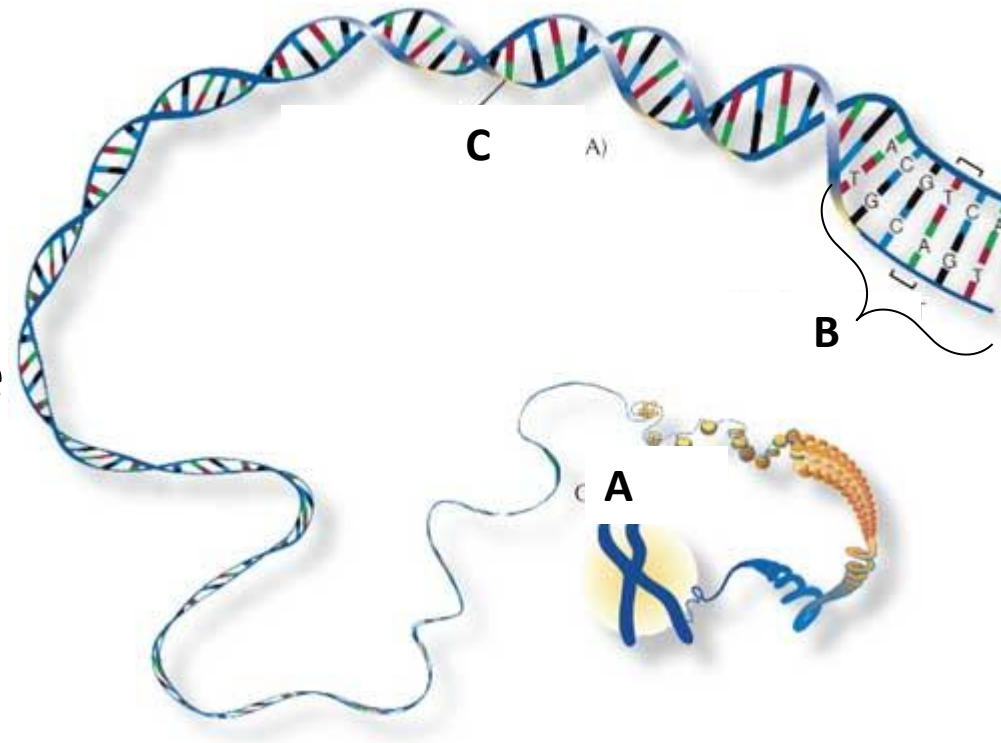


STATION 1

- Define the following terms:
 - Gene
 - DNA
 - Chromosomes

STATION 2

- What do genes code for?
How are characteristics determined?
- Name 2 types of organisms that may have the similar DNA/ genes.
- Identify
 - DNA
 - Genes
 - Chromosome



STATION 3

- How is genetic information passed down from parent to offspring?
- DNA is known as the “code of life.” What does this mean and how?

STATION 4

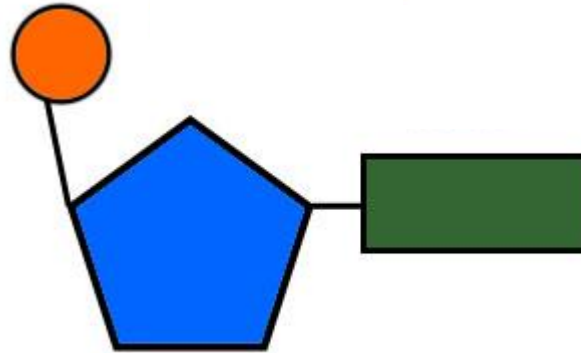
- There are two types of cells. Somatic Cells and Sex Cells. Complete the chart.

	Somatic Cell # of Chromosomes	Sex Cell # of Chromosomes
Organism 1	12	6
Organism 2	20	
Organism 3		4
Human		23

- Example of a somatic cell: _____
- Example of a sex cell: _____

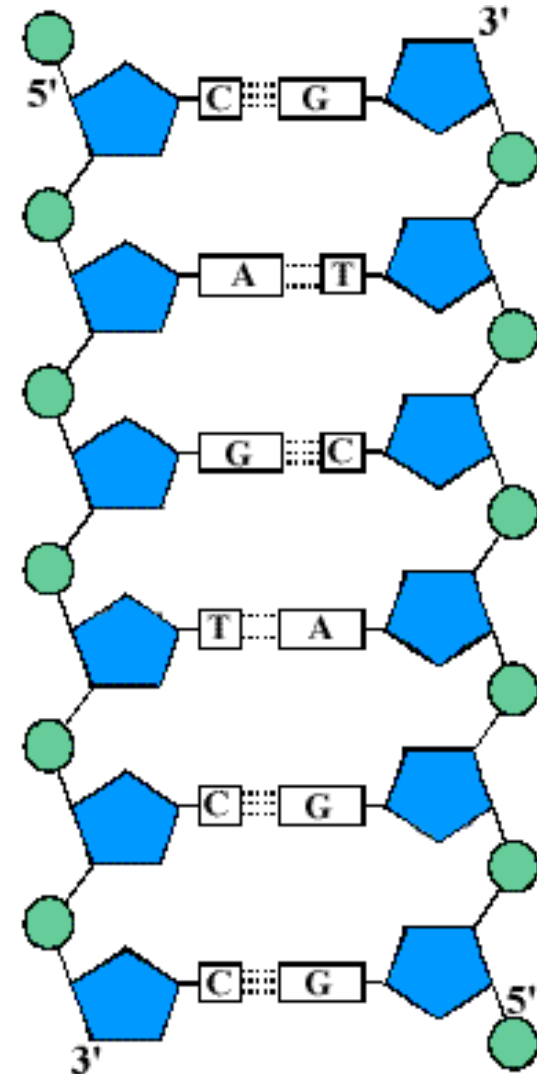
STATION 5

- The subunits of DNA and RNA are nucleotides. Identify the parts below.



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- What is the full name/unabbreviated name for DNA and RNA?
- What type of organic molecule are they?



STATION 6

- List the differences of DNA and RNA:
 - Sugars:
 - Nitrogenous Bases:
 - Structure:
- List the similarities of DNA and RNA:
 - Nitrogenous Bases:
 - Structure:

STATION 7

- Complimentary Rule States that
 - A always pairs with _____ or _____.
 - G always pairs with _____.
- Identify the complimentary DNA bases for the DNA molecule.

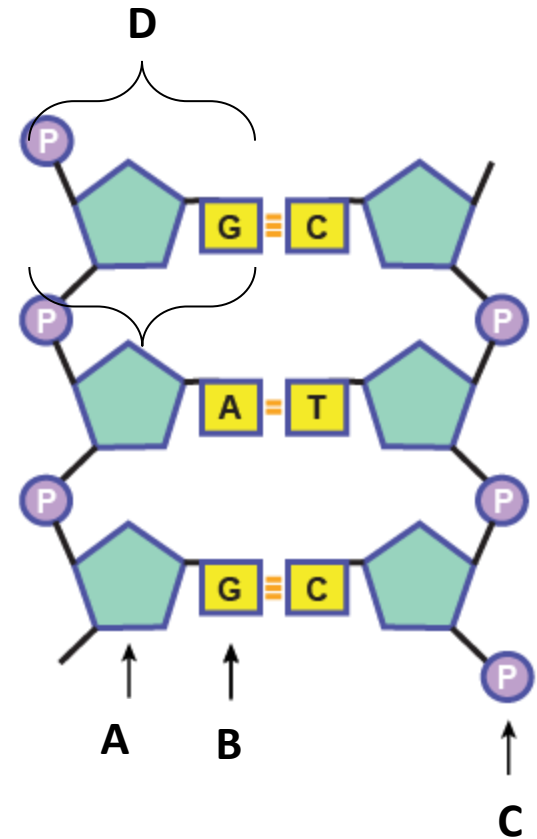
ATC GGC ATC GAT

- Identify the complimentary mRNA bases for the DNA molecule.

ATC GGC ATC GAT

STATION 8

- The picture to the right shows a nucleic acid. Answer the questions.
 - Is it DNA or RNA? How do you know?
 - What represents:
 - A
 - B
 - C
 - D



STATION 9

- Place these in order:

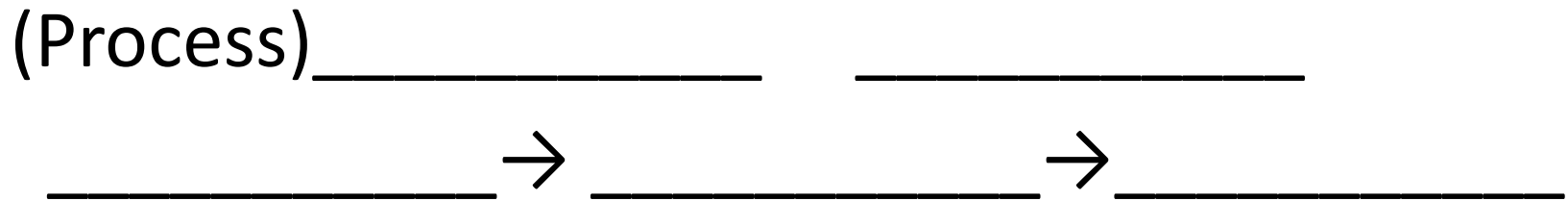
DNA

Translation

Proteins

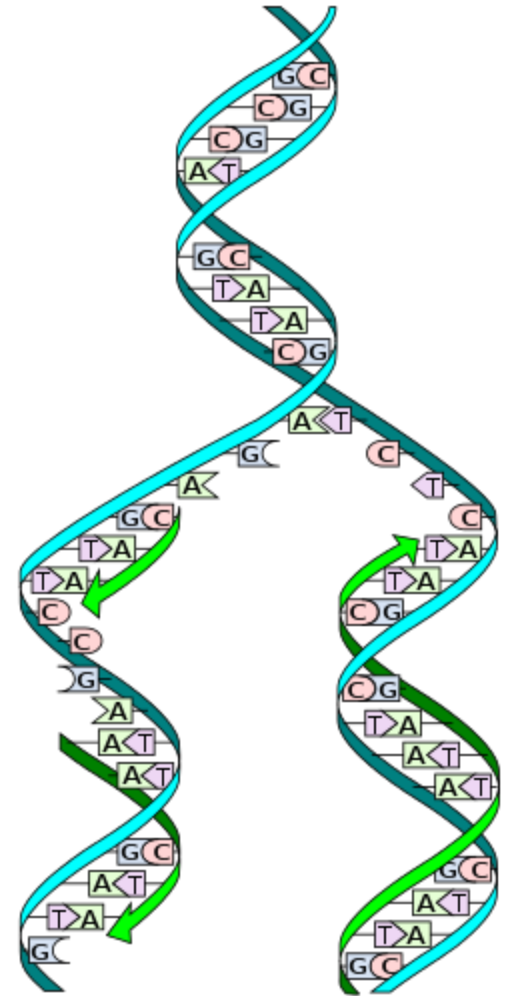
Transcription

RNA



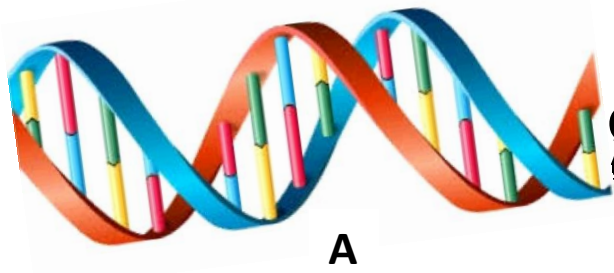
STATION 10

- Identify the process and the organelle it takes place in.
- Briefly describe the steps.
- What things are needed/required?



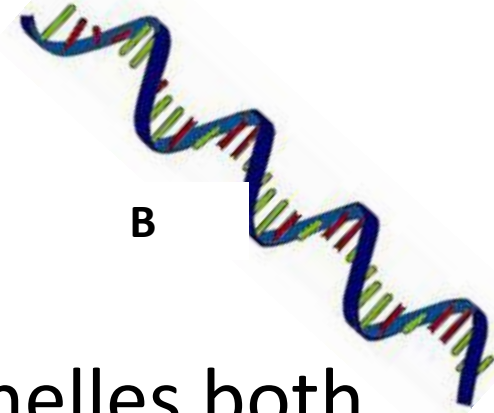
STATION 11

- What is the purpose of DNA Replication?
- What is the purpose of Transcription?
- What is the purpose of Translation?



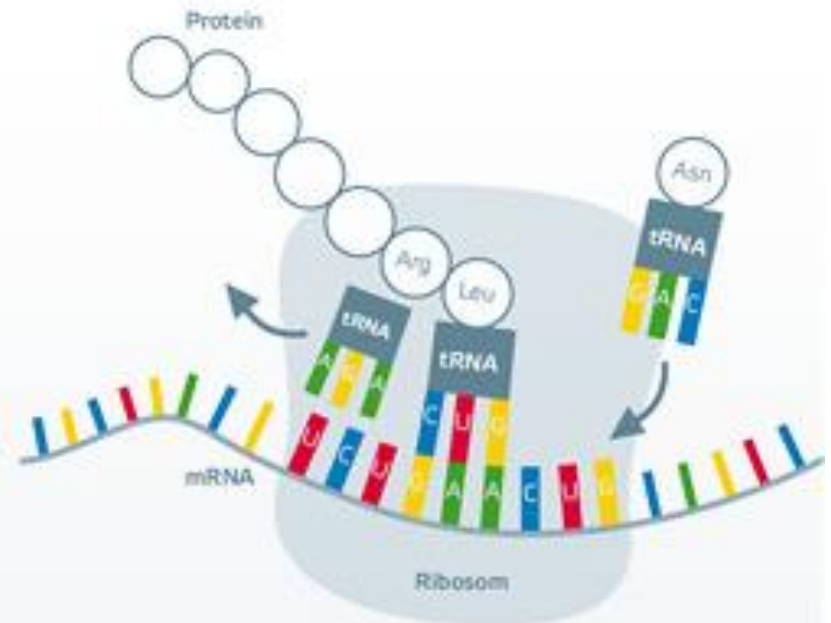
A

STATION 12



B

- Identify the processes and the organelles both takes place in.
- Identify Structure A and B at top.



STATION 13

- What is being made in DNA Replication?
- What is being made in Transcription?
- What is being made in Translation?

STATION 14

- What is used during Transcription in order to create a mRNA strand?
- Why do we need to convert the DNA code into RNA?

STATION 15

- Identify the jobs/functions of the following:
 - mRNA
 - tRNA
 - rRNA (ribosome)
 - Amino Acid

STATION 16

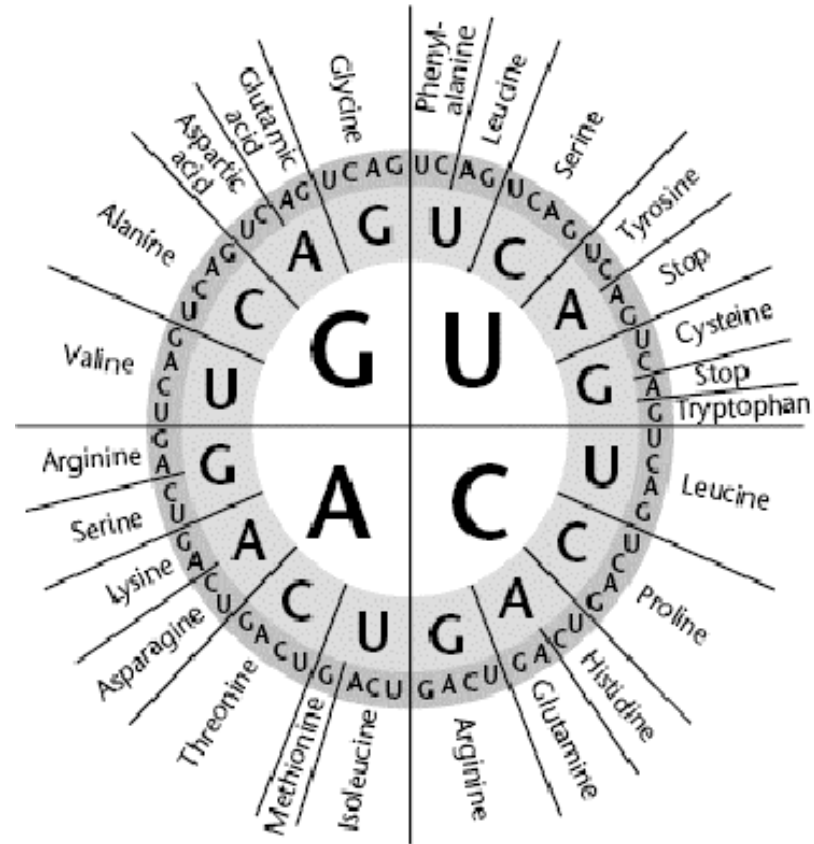
- Use the following sequence to create a protein:

DNA: TAC GGA TCG

mRNA:

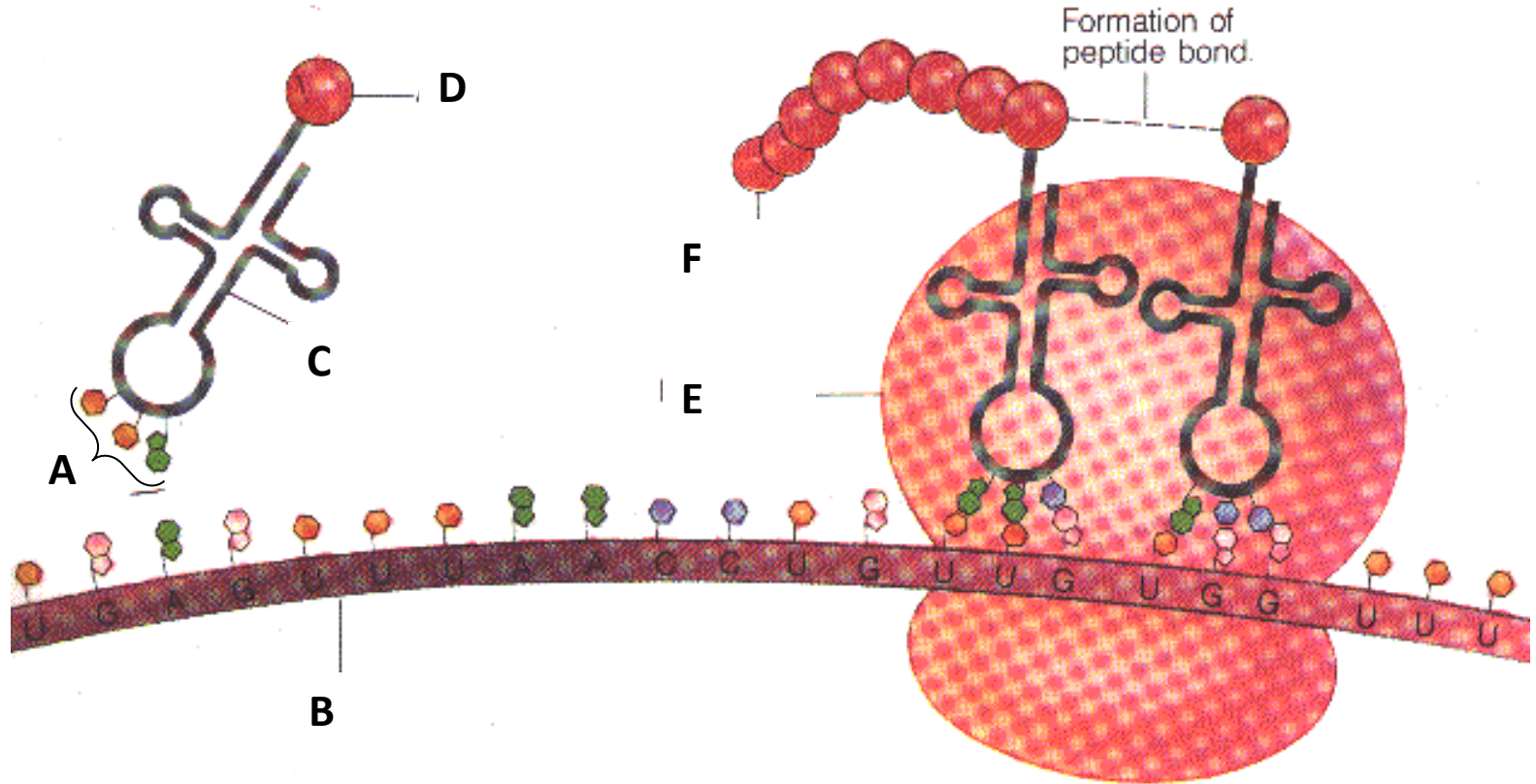
Amino Acid:

tRNA:



STATION 17

- What are these structures in Translation?



STATION 18

- What are mutations?
- Are all mutations bad/harmful? Explain.
- In order for a mutation to be passed to offspring, where does this mutation have to occur? somatic or sex cells?
- What are the two types of mutations?

STATION 19

- What is genetic engineering?
- What was the purpose of the Human Genome Project? How has it improved our understanding of Biology?

STATION 20

- What is a clone?
- How does a clone compare to the original organism?
- What is an example of a disorder used in gene therapy? What is the purpose of this research?

STATION 21

- What is an example of selective breeding and hybridization?
- Why do farmers use these processes in growing crops?
- List 3 ways plants have been genetically altered that provide benefits?

Agenda 3/20

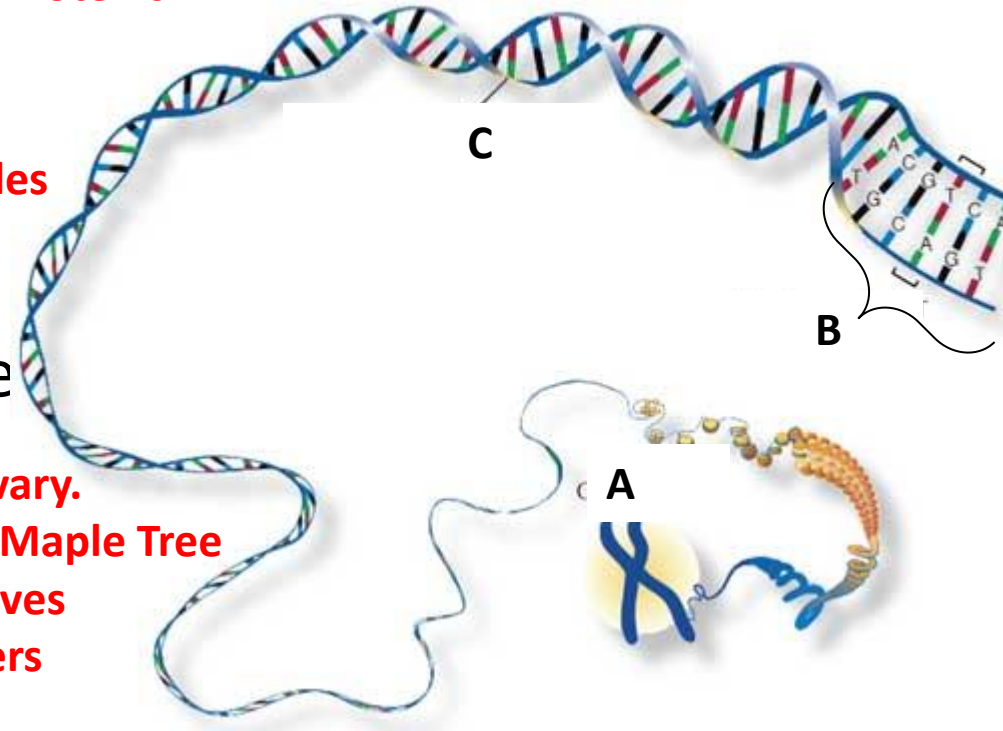
- WarmUP- Place your **bug and environment** on the back counter near your class crate. Place your **sheet (page 134) in the folder** up front!
 - Look at the quizzes handed back
 - Place study guide on desk
- Review in the Lab (140 and 141)
- **Station 4 (not mutations, cells)**
- DUT tomorrow

STATION 1

- Define the following terms:
 - Gene **A segment of DNA, that codes for a particular protein. This protein determines an organisms characteristics/traits**
 - DNA **Arrangement of nucleotides found in all living things that code for all proteins and all characteristics**
 - Chromosomes **One long, tightly coiled thread of DNA**

STATION 2

- What do genes code for? **Proteins**
How are characteristics determined? **Order of nucleotides**
- Name 2 types of Organisms that may have the similar DNA/ genes. **Answers will vary.**
Oak Tree and Maple Tree
Dogs and Wolves
Lions and Tigers
- Identify
 - DNA **C**
 - Genes **B**
 - Chromosome **A**



STATION 3

- How is genetic information passed down from parent to offspring?

DNA is inherited by offspring through sex cells in egg and sperm

- DNA is known as the “code of life.” What does this mean and how?

DNA contains the code/information for proteins. These proteins then are used to determine structure and function needed for biological processes of all living things

STATION 4

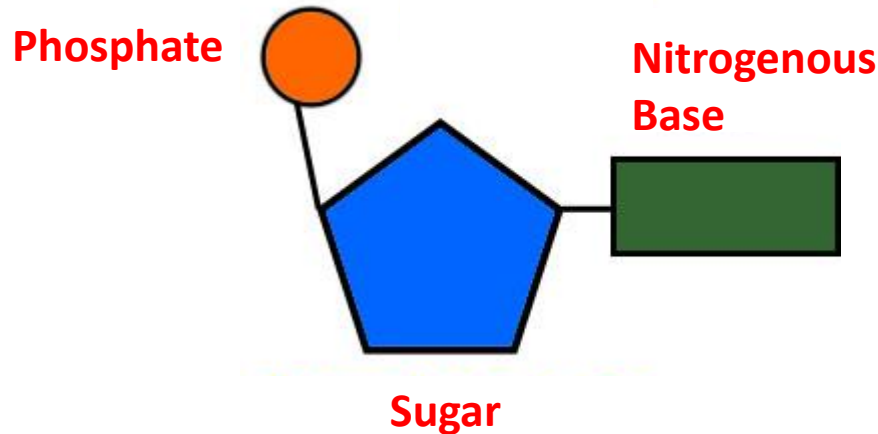
- There are two types of **CELLS**. Somatic Cells and Sex Cells. Complete the chart.

	Somatic Cell # of Chromosomes	Sex Cell # of Chromosomes
Organism 1	12	6
Organism 2	20	10
Organism 3	8	4
Human	46	23

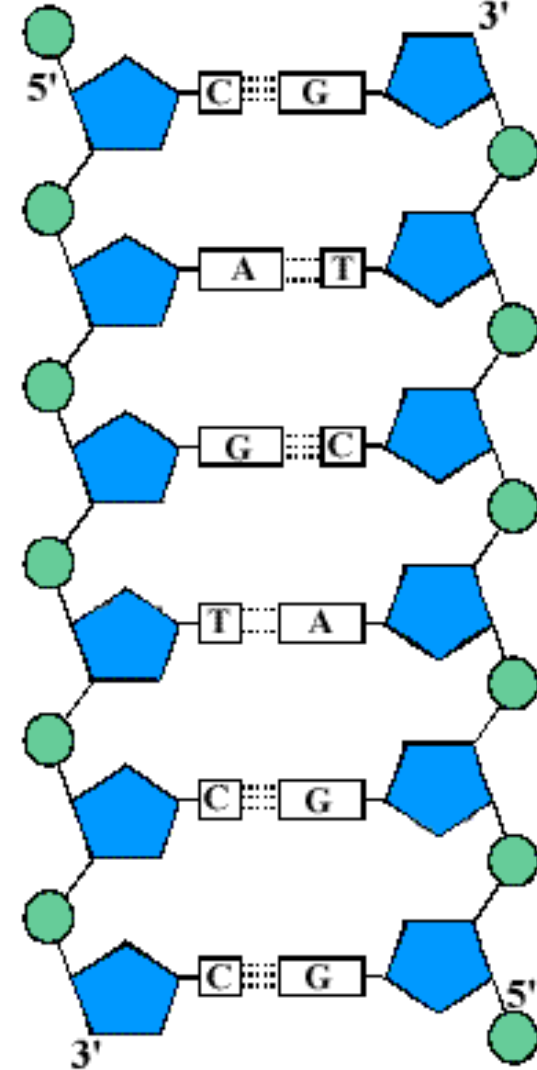
- Example of a somatic cell: Skin, liver, brain, lungs, etc
- Example of a sex cell: Sperm, egg ONLY

STATION 5

- The subunits of DNA and RNA are nucleotides. Identify the parts below.



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- What is the full name/unabbreviated name for DNA and RNA? **DNA- Deoxyribonucleic Acid**
RNA- Ribonucleic Acid
- What type of organic molecule are they? **Nucleic Acids**

STATION 6

- List the differences of DNA and RNA:
 - Sugars: **DNA- Deoxyribose** **RNA- Ribose**
 - Nitrogenous Bases: **DNA- Thymine (T)** **RNA- Uracil (U)**
 - Structure: **DNA- Double Helix** **RNA- Single Helix**

- List the similarities of DNA and RNA:
 - Nitrogenous Bases: **Cytosine, Guanine, Adenine**
 - Structure: **HELIX, Sugar and Phosphate on sides (Backbone)**

STATION 7

- Complimentary Rule States that
 - A always pairs with T or U .
 - G always pairs with C .
- Identify the complimentary DNA bases for the DNA molecule.

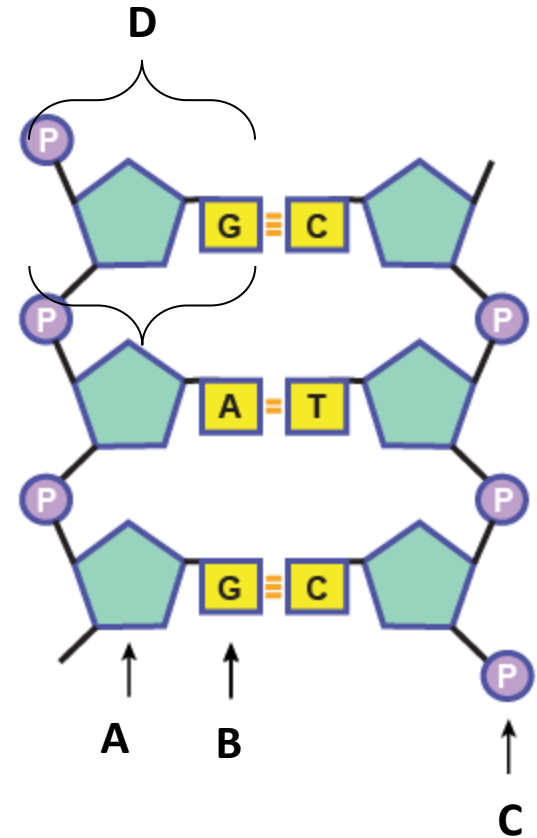
ATC GGC ATC GAT
TAG CCG TAG CTA

- Identify the complimentary mRNA bases for the DNA molecule.

ATC GGC ATC GAT
UAG CCG UAG CUA

STATION 8

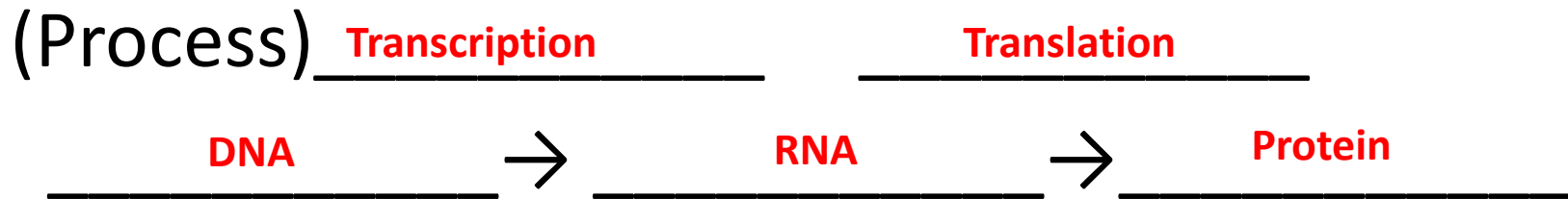
- The picture to the right shows a nucleic acid. Answer the questions.
 - Is it DNA or RNA? How do you know? **DNA, two strands and contains thymine**
 - What represents:
 - A **Sugar- Deoxyribose**
 - B **Nitrogenous Base- Guanine**
 - C **Phosphate**
 - D **Nucleotide**



STATION 9

- Place these in order:

DNA	Translation	Proteins
	Transcription	RNA



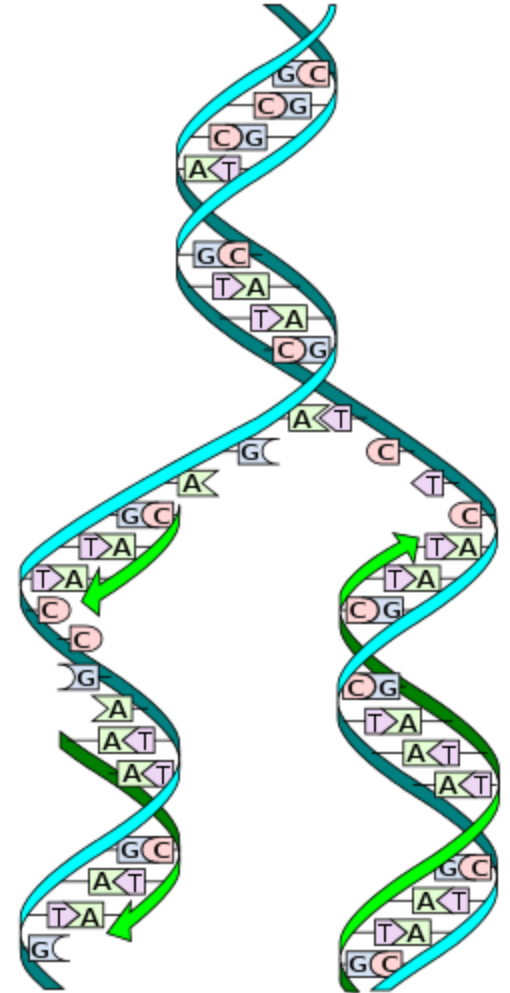
STATION 10

- Identify the process and the organelle it takes place in.

DNA Replication (Nucleus)

- Briefly describe the steps.
 1. An enzyme separates/untwists the strands of DNA
 2. Nucleotide Bases pair up
 3. Bonds are created between bases
 4. 2 new DNA molecules are created
- What things are needed/required?

DNA Nucleotides, DNA, Enzymes



STATION 11

- What is the purpose of DNA Replication?

Create 2 DNA molecules from 1 for newly made cells in Interphase

- What is the purpose of Transcription?

Produce RNA from gene (DNA) in order to create a protein

- What is the purpose of Translation?

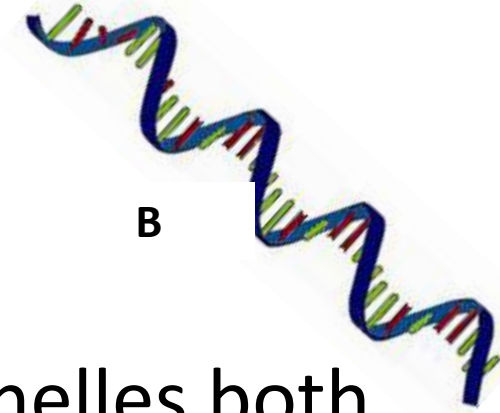
Interpret mRNA message to create protein needed by cell



A DNA

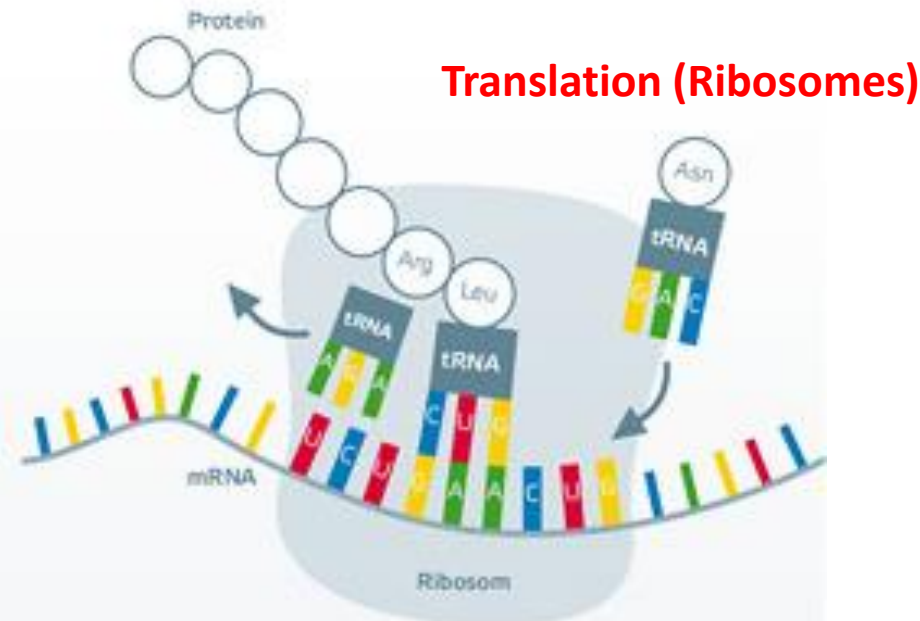
STATION 12

RNA



B

- Identify the processes and the organelles both takes place in.
- Identify Structure A and B at top.



STATION 13

- What is being made in DNA Replication?

Two DNA molecules

- What is being made in Transcription?

mRNA

- What is being made in Translation?

Protein

STATION 14

- What is used during Transcription in order to create a mRNA strand?

Section of DNA- gene

- Why do we need to convert the DNA code into RNA?

**DNA is too large and is not able to leave the nucleus to find a ribosome.
RNA is able to do so.**

STATION 15

- Identify the jobs/functions of the following:
 - mRNA **Carries DNA message to cytoplasm**
 - tRNA **Carries amino acid to ribosome**
 - rRNA (ribosome) **assembles the proteins**
 - Amino Acid **Linked together to create a protein**

STATION 16

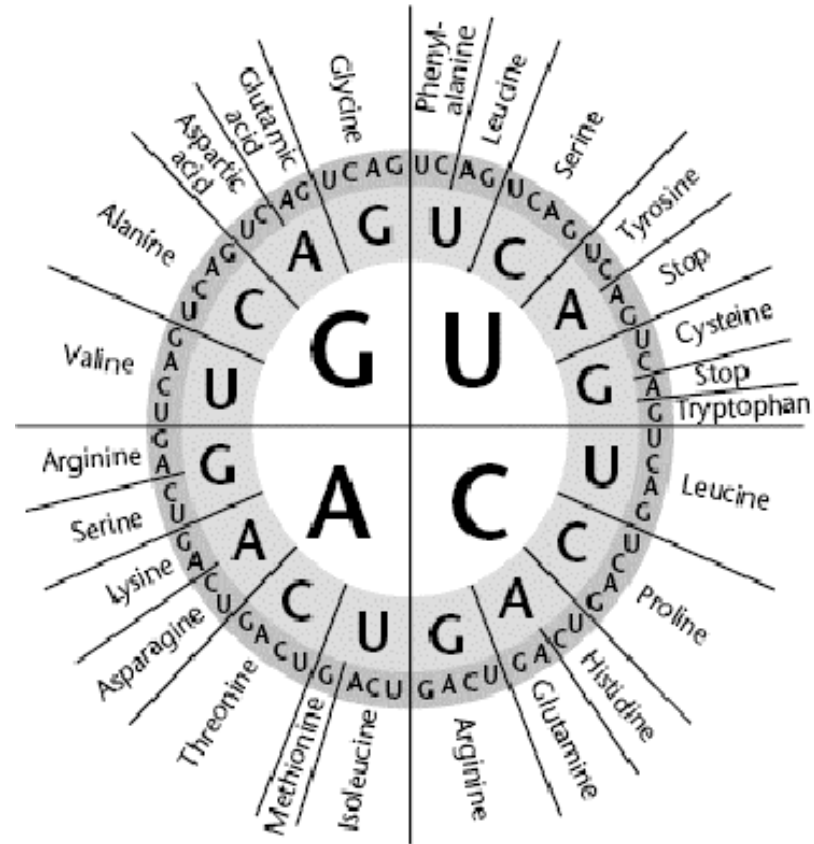
- Use the following sequence to create a protein:

DNA: TAC GGA TCG

mRNA: AUG CCU AGC

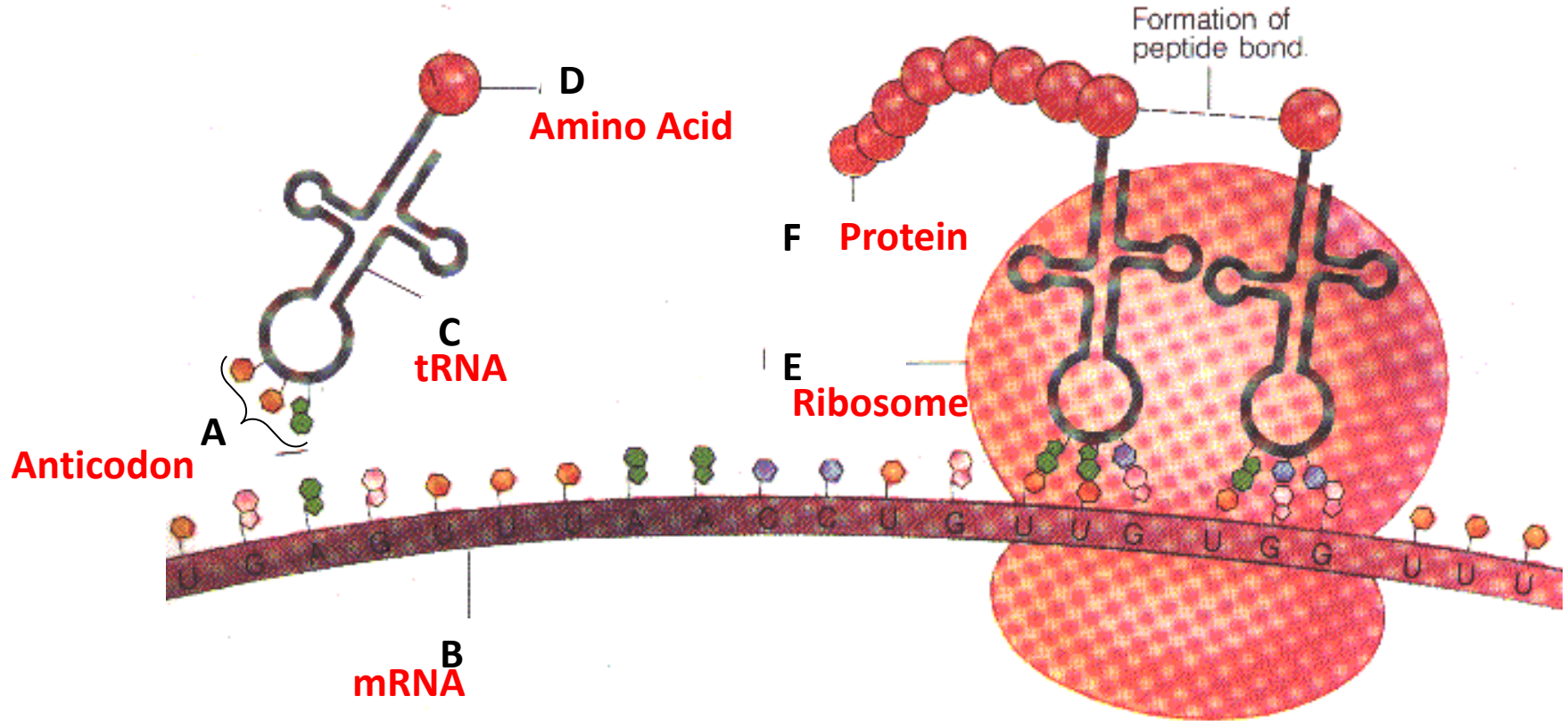
Amino Acid: MET PRO SER

tRNA: UAC GGA UCG



STATION 17

- What are these structures in Translation?



STATION 18

- What are mutations?

Alterations (single base pair or segment) of DNA

- Are all mutations bad/harmful? Explain.

No, mutations can be beneficial if they improve an organisms likeliness to survive

- In order for a mutation to be passed to offspring, where does this mutation have to occur? somatic or sex cells?

Sex Cells (Sperm and Egg)

- What are the two types of mutations? **Gene and Chromosomal**

STATION 19

- What is genetic engineering?

Replacing genes. Remove a specific gene from one organism and placing it in another

Ex: glowing puppies, ears on back of mouse, etc.

- What was the purpose of the Human Genome Project? How has it improved our understanding of Biology?

Mapping the DNA sequence of human genes; We now know where all genes are located in human DNA

STATION 20

- What is a clone?

An identical copy of a gene or entire organism

- How does a clone compare to the original organism?

Contains the same DNA and genes

- What is an example of a disorder used in gene therapy? What is the purpose of this research?

Cystic Fibrosis, Tay-Sachs, and Sickle-cell Anemia; by inserting the correct gene into individuals with the disorder/disease, the correct protein will be created and eliminate the disorder/disease

STATION 21

- What is an example of selective breeding and hybridization?

Answers will vary. Selective Breeding- Dog breeds, Crops; Hybrid- Mule (cross between horse and donkey), Zedonk (Donkey and Zebra), Liger (Lion and Tiger)

- Why do farmers use these processes in growing crops?

Produce crops with desirable/certain traits

- List 3 ways plants have been genetically altered that provide benefits?

Spoil slower, more nutritious, and resistant to pesticides/chemicals and weather changes/frost

Now?

- Study for DUT tomorrow!
- Show Human Practice Example on p 132.