Central Dogma of Biology Procedures

1. **Replication**
2. **Transcription**
3. **Translation**

Replication

1. **Purpose**: Replication produces two identical copies of a DNA double-stranded molecule, so that they can be inherited by the two daughter cells of a parent cell.
2. **Procedure**: Each strand serves as a template for the synthesis of its complementary strand in an antiparallel orientation, following Chargaff's rule.

Transcription

1. **Purpose**: Transcription produces a messenger RNA (mRNA) copy of the gene's DNA coding strand. mRNAs are expendable molecules that will be translated into polypetide chains in the cytoplasm.
2. **Procedure**: The non-coding DNA strand of the gene serves as a template for the synthesis of mRNA, according to Chargaff's rule.

Translation

1. **Purpose**: Translation connects amino acids, forming a polypeptide chain, using the information that is stored in DNA coding regions.
2. **Procedure**: Ribosomes facilitate the formation of the peptide bonds between amino acids. Transfer RNAs (tRNAs) read the mRNA's sequence, 3 nitrogenous bases (codons) at a time. They pair their anti-codon with the next available codon, ensuring the proper positioning of the corresponding amino acid. The Codon - Anti-codon pairing, in anti-parallel orientation, follows the Chargaff's rule.

DNA Nitrogenous Bases Table

Table 1A: DNA Nitrogenous bases

	Name	Category
1.	Adenine (A)	Purine
2.	`Thymine (T)`	Pyrimidine
3.	Guanine (G)	Purine
4.	Cytosine (C)	Pyrimidine

RNA Nitrogenous Bases Table

Table 1B: RNA Nitrogenous bases

	Name	Category
1.	Adenine (A)	Purine
2.	`Uracil (U)`	Pyrimidine
3.	Guanine (G)	Purine
4.	Cytosine (C)	Pyrimidine

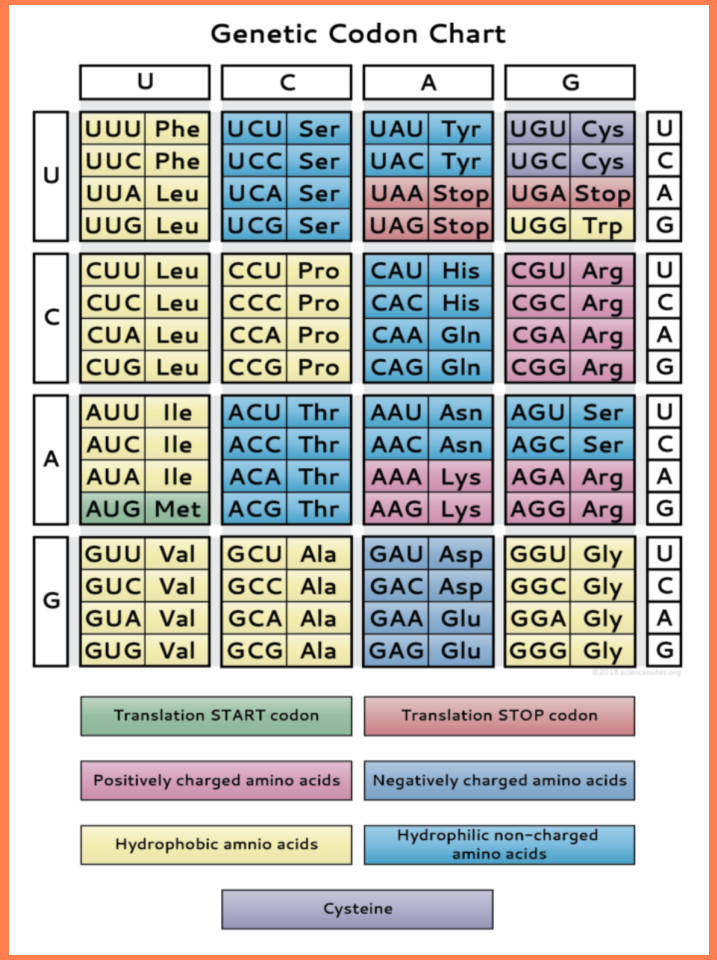
Chargaff's Rule of Complementary Nitrogenous Bases Pairing

According to Chargaff's rule the complementary pairings are:

1. A pairs with U via 2 Hydrogen bonds.
2. A pairs with T via 2 Hydrogen bonds.
3. G pairs with C via 3 Hydrogen bonds.

Standard Genetic Code Table

Image taken from: sciencenotes.org



Central Dogma of Biology Summary Table

Table 2: DNA Coding Sequence Replication, Transcription and Translation (Central Dogma)

Procedure	Macromolecule	Starting Edge	Starting Codon	Codon 1	Codon 2	Termination Codon	Ending Edge
	DNA coding	5'	ATG	GAG	CTC	TAA	3'
Replication	DNA complementary	3'	TAC	CTC	GAG	ATT	5'
Transcription	mRNA	5'	AUG	GAG	CUC	UAA	3'
Translation	Polypeptide	H_2N	Met	Glu	Leu	-	COOH

The End

- For more information check your eclass!