DNA Structure

Deoxyribo **N**ucleic **A**cid
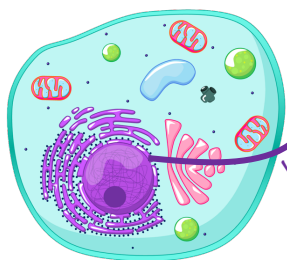
Fun Fact!
"The DNA of a single cell is 2 meters long"
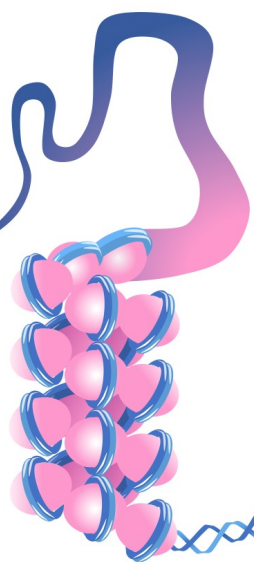...so how does it all fit?

In the nucleus

CHROMOSOME
wound-up DNA
(23 pairs per cell)

SUPERCOILING
That's how it all fits together!

BASES

T **T**hymine	**A** **A**denine
C **C**ytosine	**G** **G**uanine

DOUBLE STRANDED HELIX
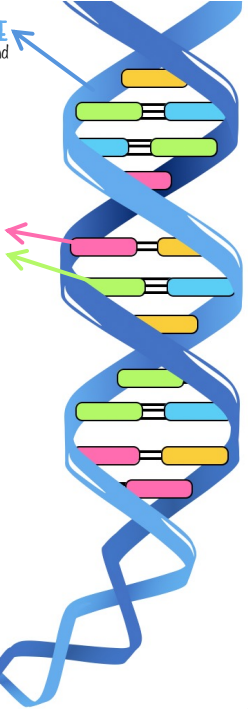
BACKBONE
(Includes phosphates and deoxyribose sugars)

ANTI-PARALLEL STRANDS

@TeachMe-Official
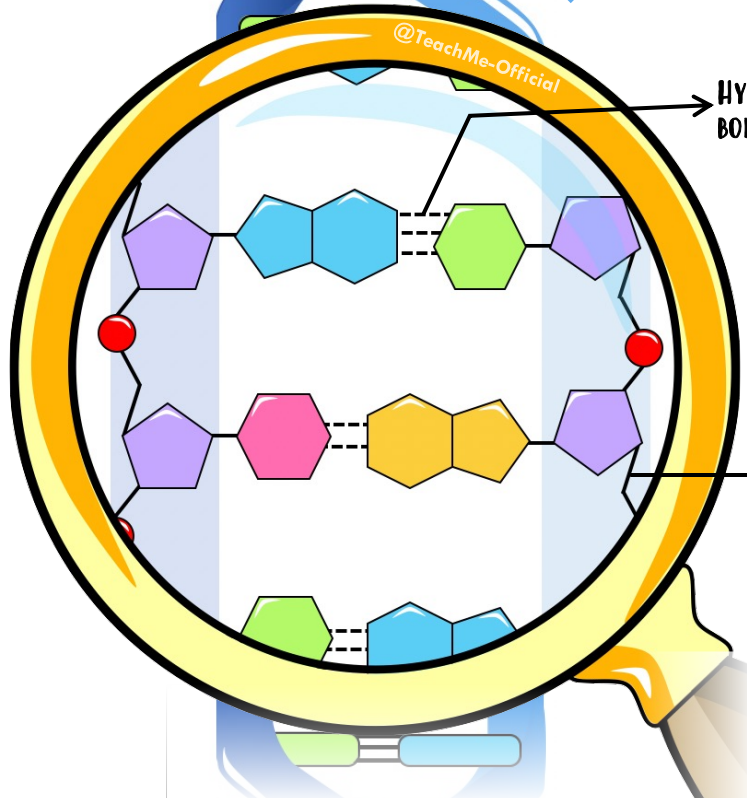
HYDROGEN bonds

COVALENT bonds
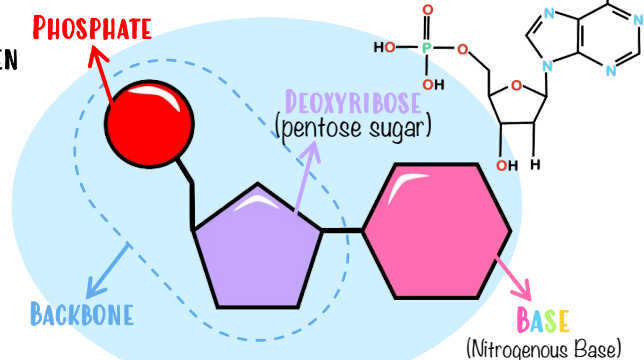
PHOSPHATE

DEOXYRIBOSE (pentose sugar)

BACKBONE

BASE (Nitrogenous Base)

NUCLEOTIDE (monomer)

Nucleotides are linked together by a **CONDENSATION** reaction to form a polymer (DNA)

MONOMER MONOMER MONOMER
↓ Condensation reaction
MONOMER MONOMER
MONOMER MONOMER
MONOMER MONOMER } POLYMER
MONOMER MONOMER

PURPOSE OF DNA?

"the instruction manual"

Genes

Gene is a segment of DNA that codes for a protein

Three nucleotides (called a **CODON**) codes for one amino acid

Amino acids

Protein
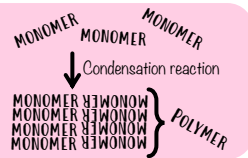
COMPLEMENTARY BASE PAIRING

A --- **T**

C --- **G**
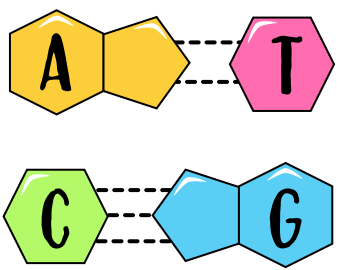
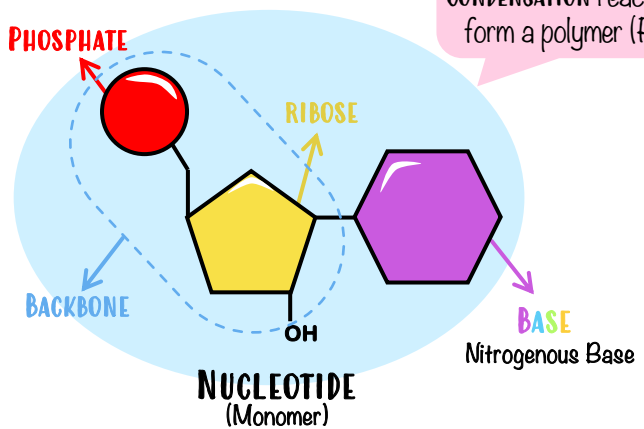**HOW TO REMEMBER?**
"A" AND "T" ARE
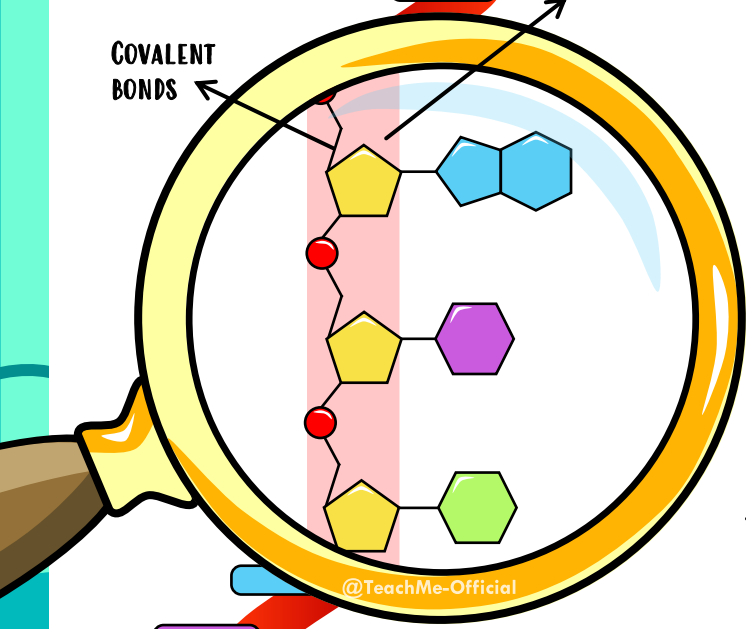**A**lways **T**ogether

Teach Me
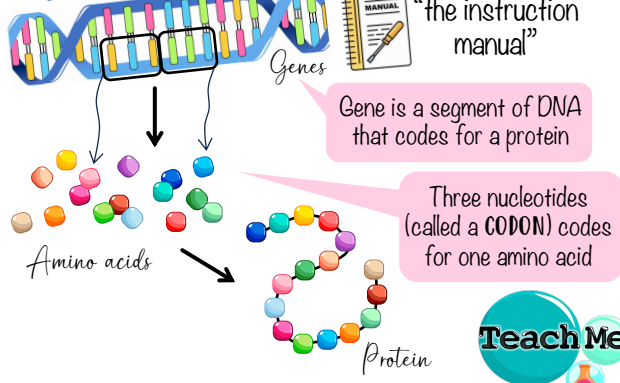
RNA Structure
RiboNucleic Acid

Nucleotides are linked together by a CONDENSATION reaction to form a polymer (RNA)
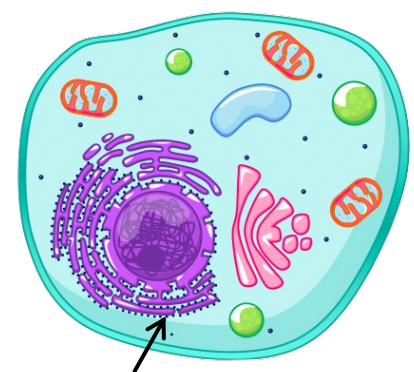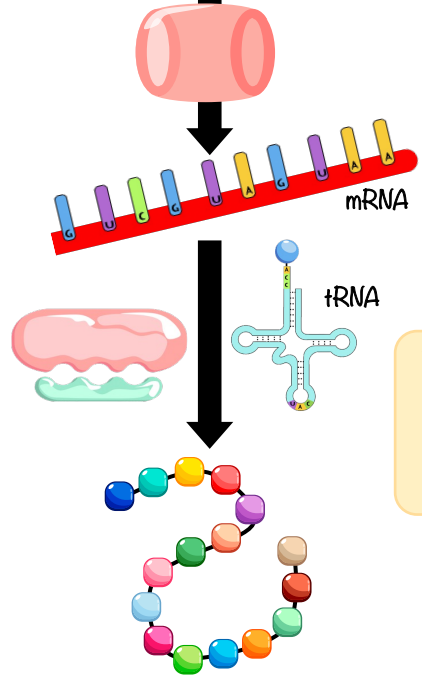
Covalent bonds

Backbone

Phosphate

RIBOSE
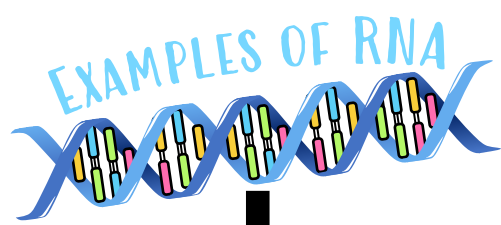
BACKBONE

OH

BASE

Nitrogenous Base

NUCLEOTIDE
(Monomer)

BASES

U Uracil	**A** Adenine
C Cytosine	**G** Guanine

Uracil is only for RNA and Thymine is only for DNA

@TeachMe-Official

SINGLE STRANDED

EXAMPLES OF RNA

mRNA

tRNA

rRNA
Found in ribosomes

NOTE!
You **WILL** learn about these types of RNA in greater detail in another chapter, just be aware that they exist for now.
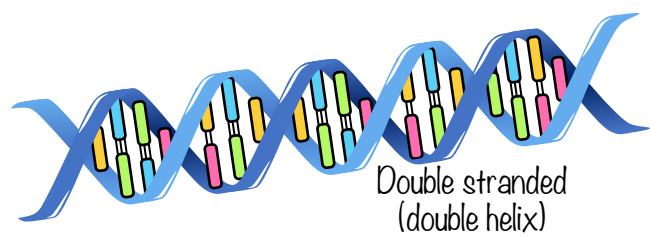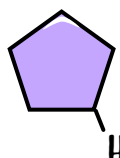
Teach Me

DNA vs. RNA

DNA
DeoxyriboNucleic Acid

RNA
RiboNucleic Acid

PURPOSE

Acts as permanent genetic code of a cell/organism

Does not contain a permanent genetic code, can serve as mRNA, tRNA and rRNA.

STRANDS & SHAPE

Double stranded (double helix)
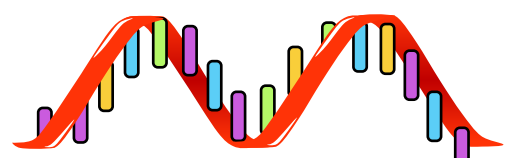
Single stranded (shape depends on RNA type)

SUGAR (PENTOSE SUGAR)

Deoxyribose

H

Ribose

OH

BASE

T Thymine

A Adenine

C Cytosine

G Guanine

! Uracil is only for RNA and Thymine is only for DNA

U Uracil

A Adenine

C Cytosine

G Guanine

DNA VS. RNA Nucleotides

Phosphate

Base

H

Deoxyribose

DNA

Phosphate

Base

OH

Ribose

RNA
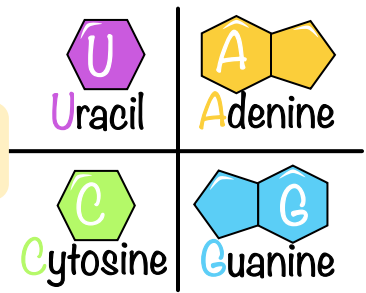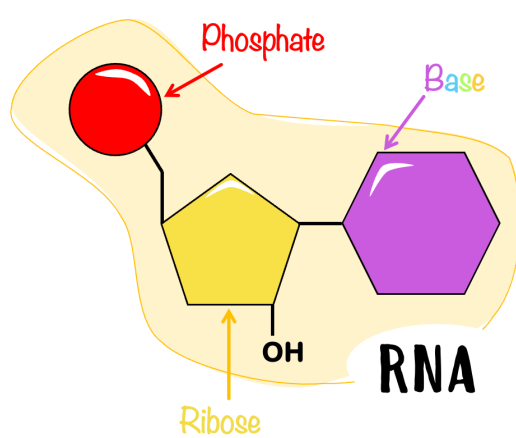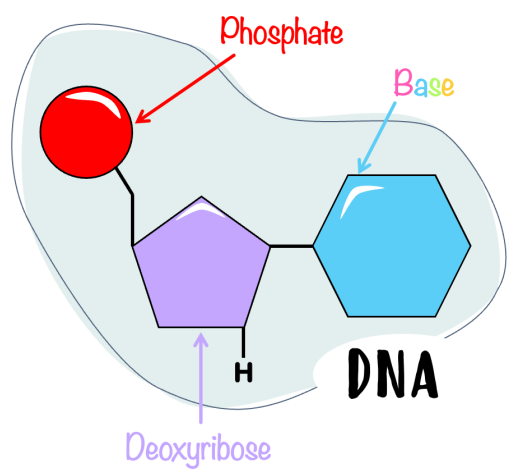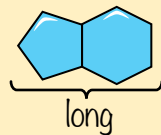
NOTE !

You DO NOT need to memorize the relative lengths of the bases nor the number of hydrogen bonds between bases for your exam!

short

long

Teach Me

Notes