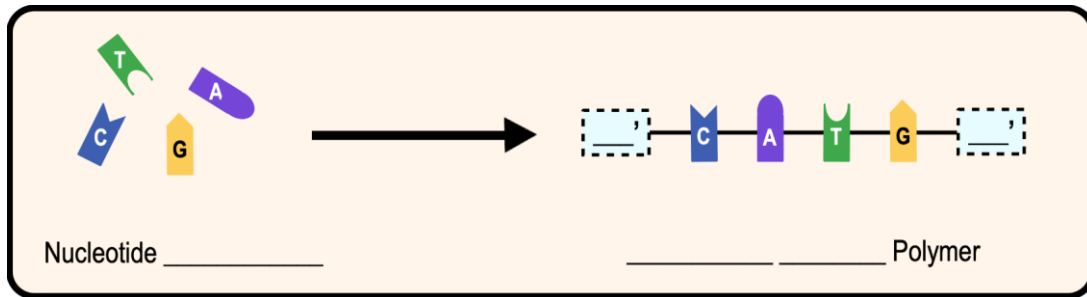


CONCEPT: NUCLEIC ACIDS

● **Nucleic Acids:** a class of biomolecule polymers that *store/encode* _____ information (ex. DNA).

- _____: *monomers* or “building blocks” of *nucleic acid polymers*.
- Nucleic acid polymers have *directionality* (_____ & _____ ends).

EXAMPLE: Formation of nucleic acids from nucleotide monomers.



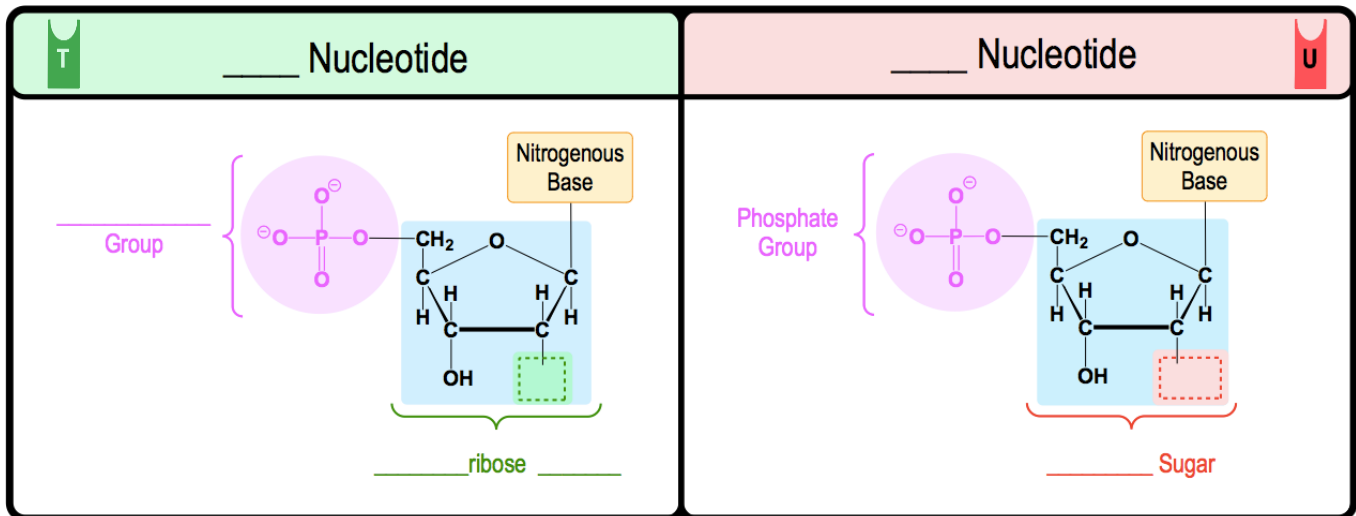
Nucleotides

● **Nucleotide** monomers consist of _____ components:

- 1) a _____ *group*.
- 2) a _____ *sugar*.
- & 3) a _____ *base*.

- **Deoxyribonucleic Acid** (_____) & **Ribonucleic Acid** (_____) use *different* sugars in their nucleotides.

EXAMPLE: DNA vs. RNA Nucleotides.



EXAMPLE: What is the difference between the sugar group in DNA and the sugar group in RNA?

- a) The sugar group in DNA is a hexose, while the sugar group in RNA is a pentose.
- b) The sugar group in DNA has an extra hydroxyl group than the sugar group in RNA.
- c) The sugar group in DNA has one less hydroxyl group than the sugar group in RNA.
- d) The sugar group in DNA contains one less carbonyl group than the sugar group in RNA.
- e) The sugar group in DNA and RNA are not different.

CONCEPT: NUCLEIC ACIDS

PRACTICE: Which of the following descriptions best fits the class of molecules known as nucleotides?

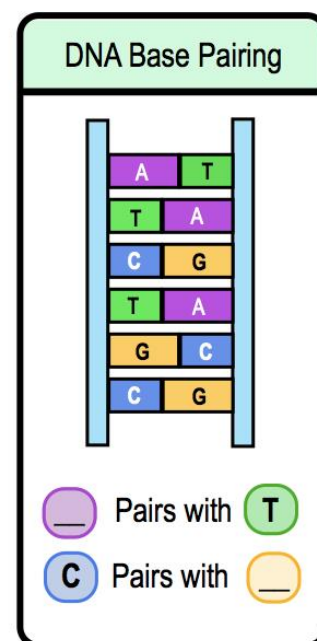
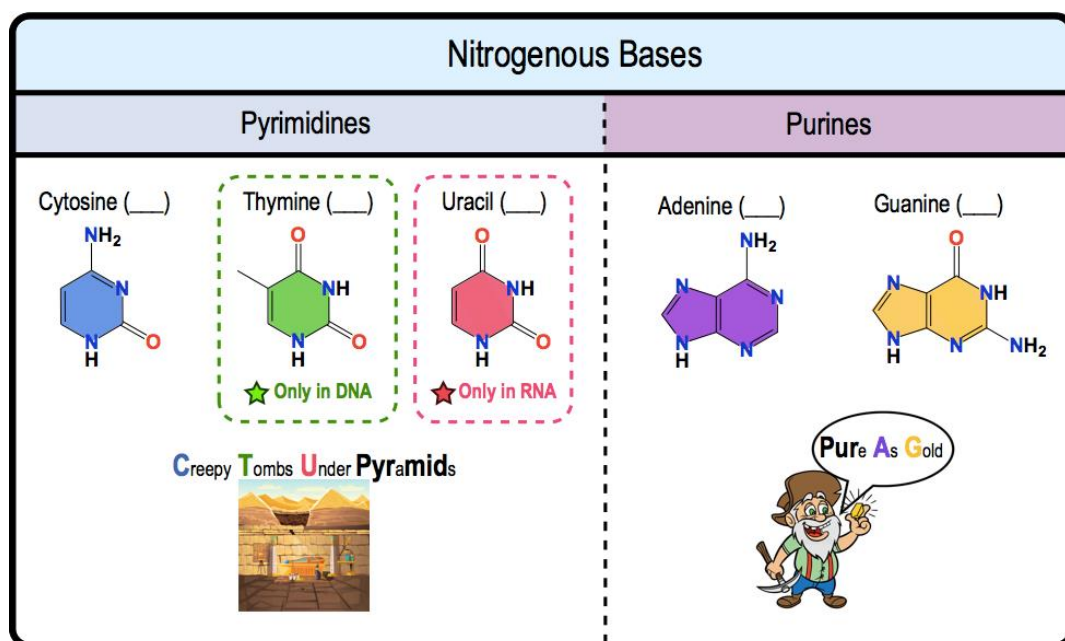
- a) A nitrogenous base & a phosphate group.
- b) A nitrogenous base & a sugar.
- c) A nitrogenous base, phosphate group & a sugar.
- d) A nitrogenous base, a carbohydrate, & a sugar.

5 Nitrogenous Bases

• _____ different nitrogenous bases are grouped as *pyrimidines* or *purines*.

1) **P_____rimidines:** *single*-ringed molecules. & 2) **Purines:** *double*-ringed molecules.

• In DNA's structure, nitrogenous bases on different DNA strands base-_____ together (**A** with **T** & **C** with **G**).



EXAMPLE: The purine nitrogenous bases are _____:

- a) Adenine and thymine.
- b) Adenine and uracil.
- c) Guanine and thymine.
- d) Guanine and cytosine.
- e) Adenine and guanine.
- f) Uracil and thymine.

PRACTICE: The four nitrogenous bases commonly found if DNA are:

- a) Adenine, thymine, cytosine, uracil
- b) Uracil, adenine, cytosine, guanine.
- c) Uracil, cytosine, guanine, thymine.
- d) Adenine, thymine, cytosine, guanine.
- e) None are correct.

CONCEPT: NUCLEIC ACIDS

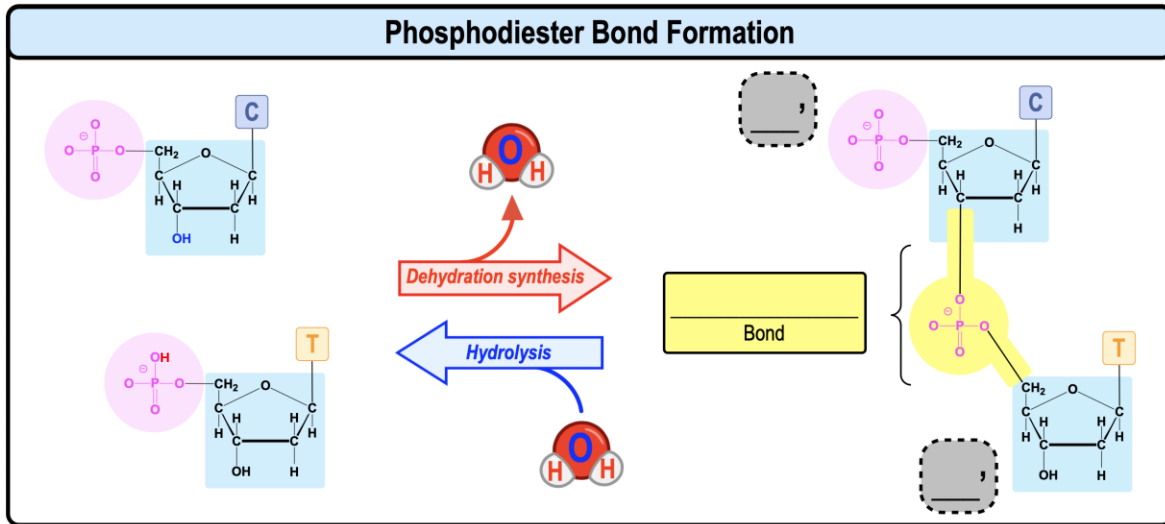
Formation & Breakdown of Nucleic Acids

● Recall: *Dehydration Synthesis*: links _____ together to _____ nucleic acid polymers.

□ _____ **Bonds**: the covalent bonds that link nucleotides together.

□ Results in the sugar-phosphate “_____”.

□ Has directionality of _____ 'phosphate end' → _____ 'hydroxyl end'.



DNA vs. RNA

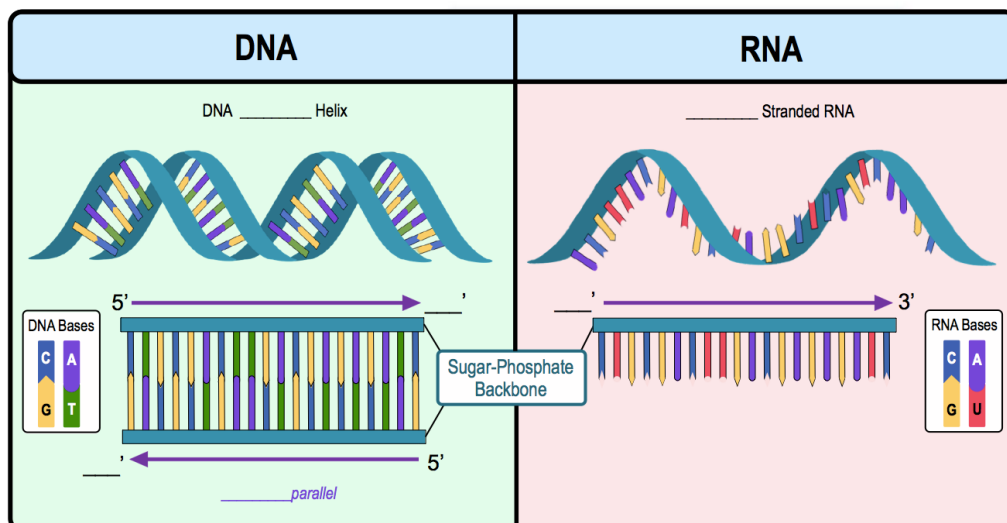
● Deoxyribonucleic acid (_____) stores genetic/hereditary information in the cell.

□ Forms a _____-helix with 2 _____-parallel strands connected by base-pair *hydrogen bonding*.

● Ribonucleic acid (_____) has a variety of functions including acting as a template for synthesizing proteins.

□ Usually forms a _____-stranded nucleotide chain.

EXAMPLE: Structure of DNA & RNA.



CONCEPT: NUCLEIC ACIDS

PRACTICE: Which of the following statements about DNA structure is true?

- a) The nucleic acid strands in a DNA molecule are oriented antiparallel to each other.
- b) Nucleic acids are formed through phosphodiester bonds that link complementary nucleobases together.
- c) Hydrogen bonds formed between the sugar-phosphate backbones of the two DNA chains stabilize the structure.
- d) The pentose sugar in DNA is ribose (containing two hydroxyl groups).