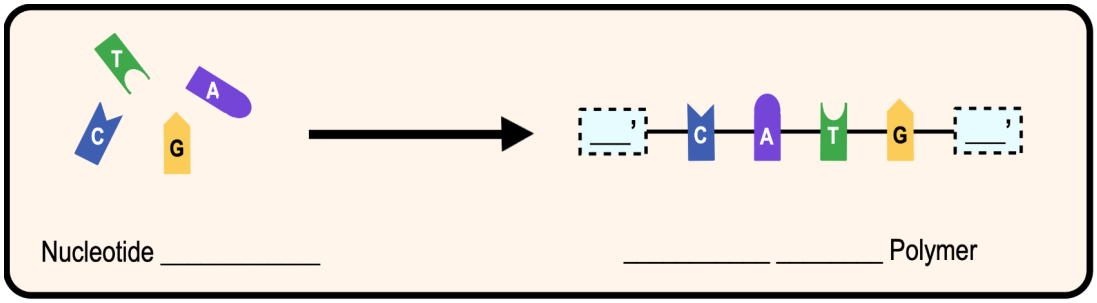
CONCEPT: NUCLEIC ACIDS

●**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.



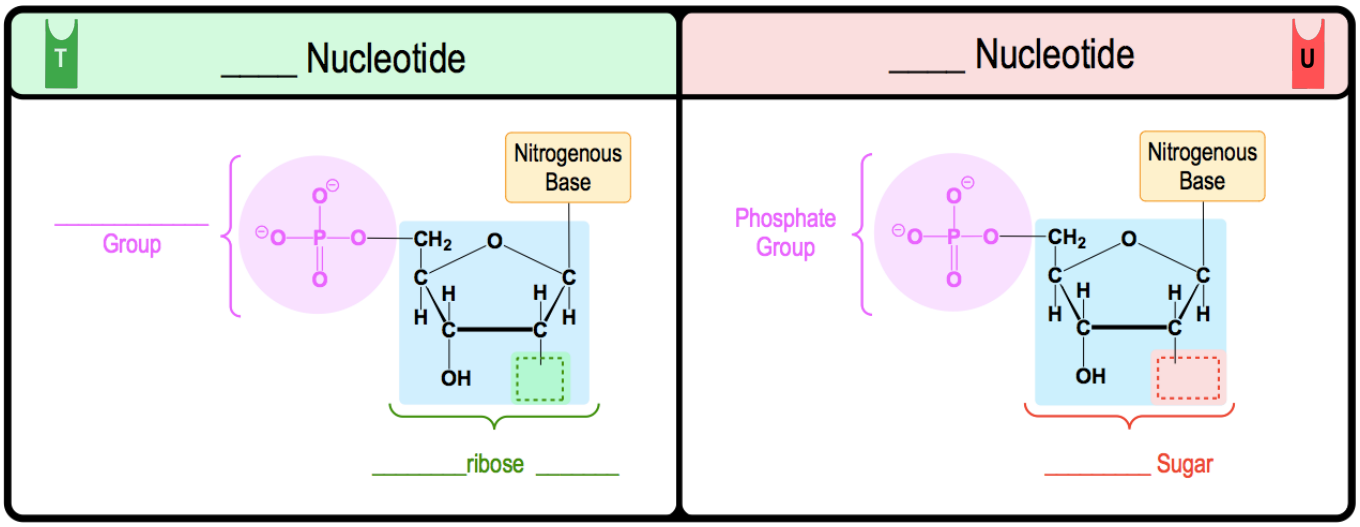
Nucleotides

●*Nucleotide* monomers consist of _____ components:

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

□ **D**eoxyribo**n**ucleic **A**cid (_____) & **R**ibo**n**ucleic **A**cid (_____) 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?

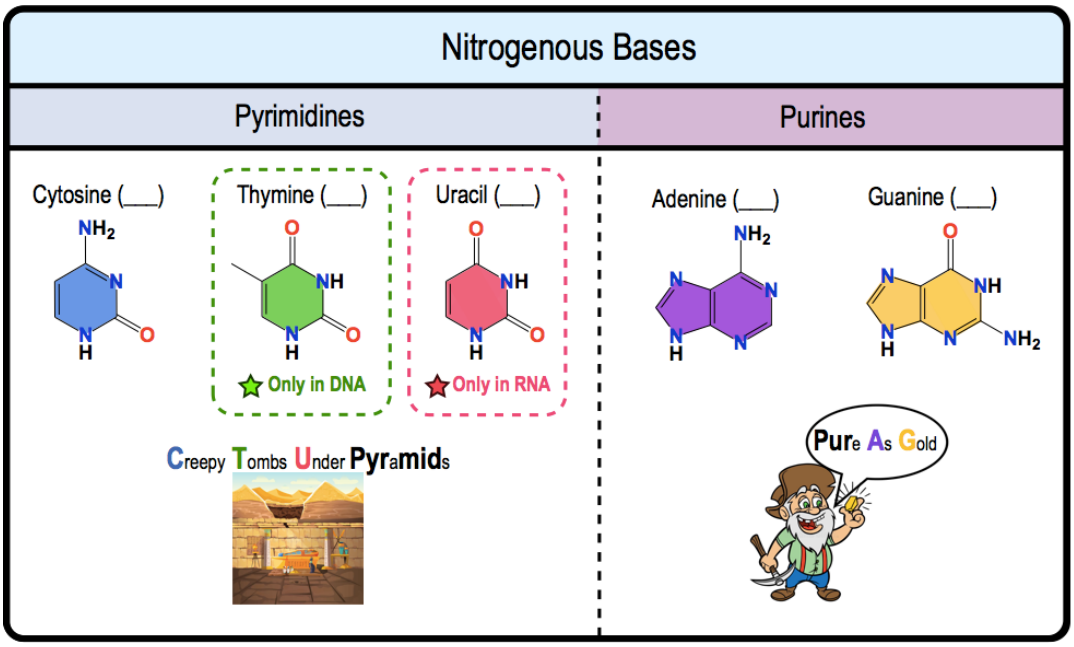
a) A nitrogenous base & a phosphate group.
b) A nitrogenous base & a sugar.
c) A nitrogenous base, phosphate group & a sugar.
d) A nitrogenous base, a carbohydrate, & a sugar.

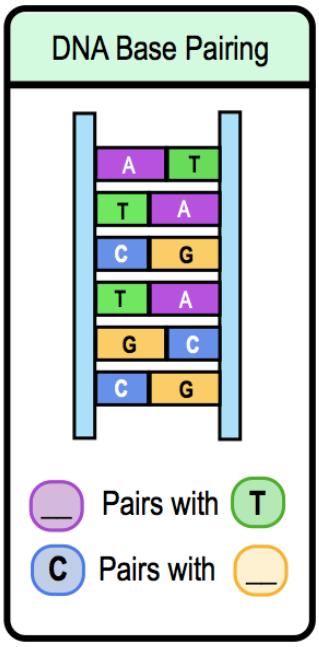
5 Nitrogenous Bases

●_____ 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

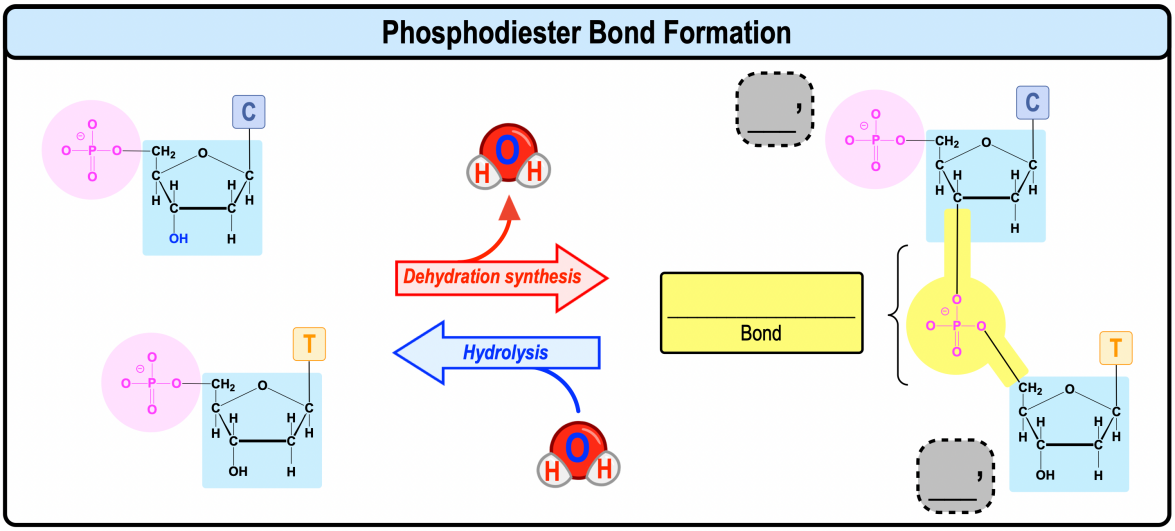
Formation & Breakdown of Nucleic Acids

●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

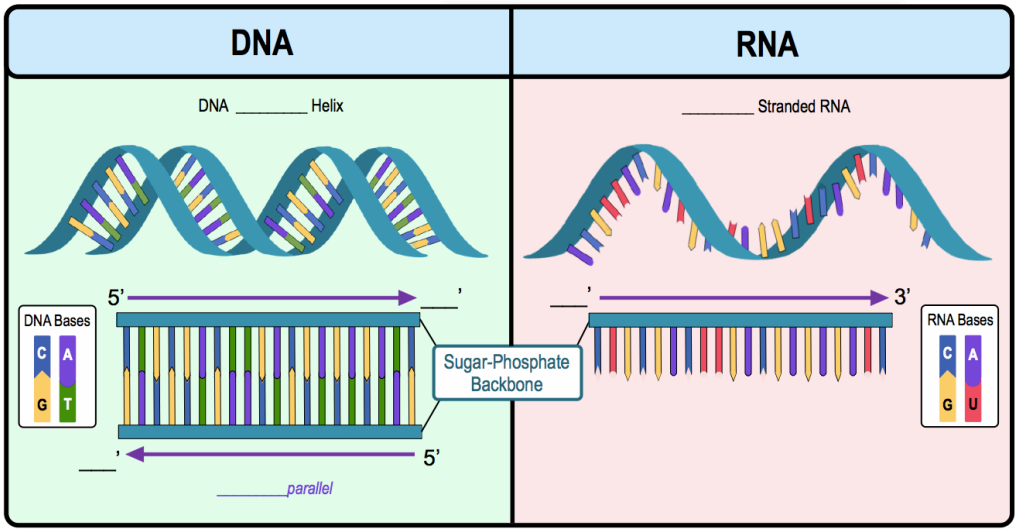
●**D**eoxyribo**n**ucleic **a**cid (_____) *stores* genetic/hereditary information in the cell.

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

●**R**ibo**n**ucleic **a**cid (_____) 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).