

hey

## Intro to genetics

What is the chromosomal theory of inheritance?

Inherited traits are controlled by genes that are found on chromosomes.

What is the difference between a gene and a chromosome?

- Genes are segments of DNA that carry "instructions" for traits (variations of these are alleles).
- chromosomes are made of condensed DNA (Aka genes)

List the differences and similarities between DNA and RNA?

DNA: double stranded, Thymine, and has deoxyribose

RNA: usually single stranded, uracil, and has ribose

Using the chart I provided, what would be the corresponding amino acid to the RNA sequence?

5'-UUU/AUG/GCU/CAC/UGA-3'

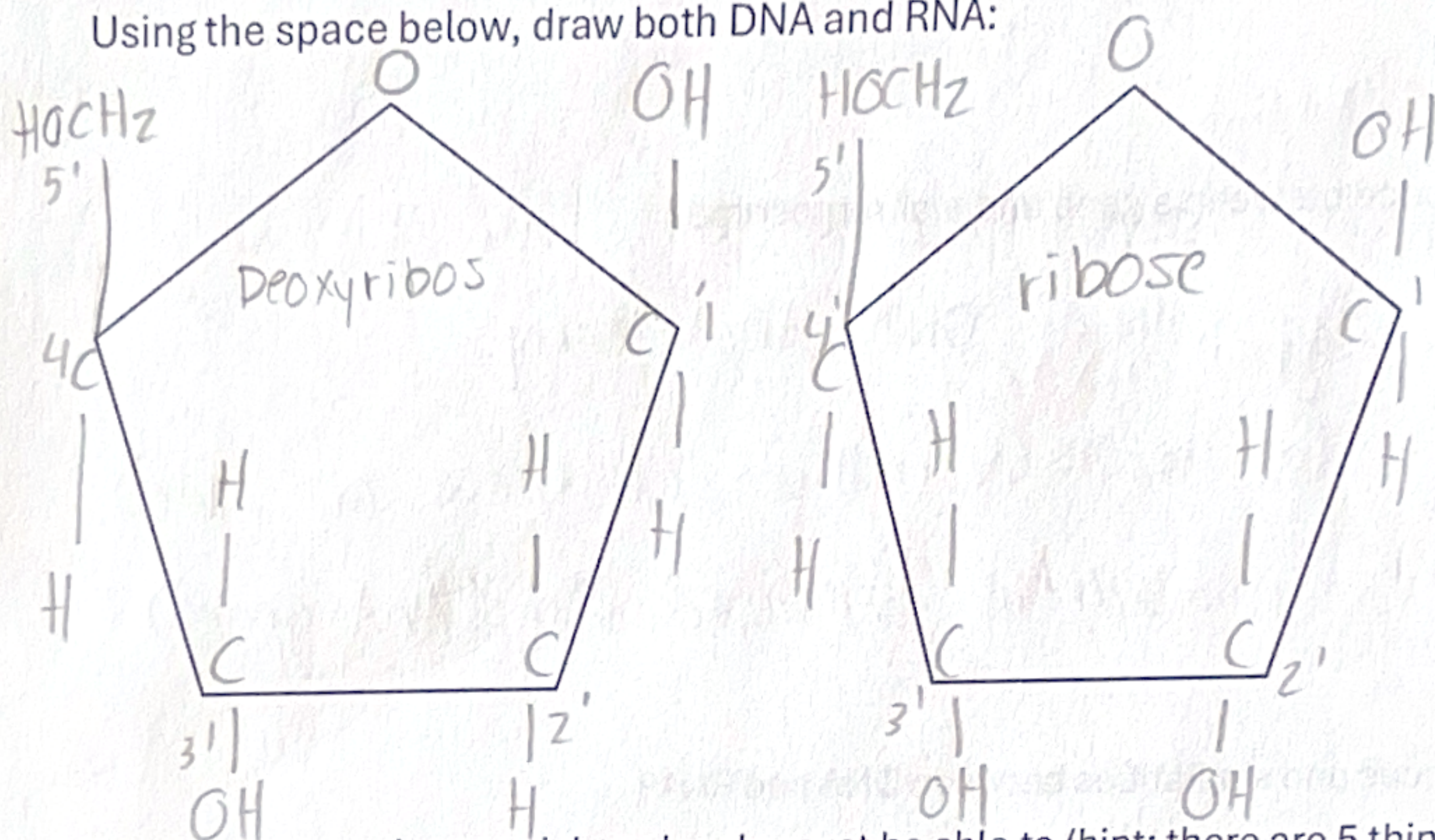
AUG → start      GCU → Ala      CAC → His      UGA → stop



What do scientists do when they are studying a gene using gene knockout?

They remove a gene to see what it does.

Using the space below, draw both DNA and RNA:



To serve as genetic material, molecule must be able to (hint: there are 5 things):

replicate, store info, express info, transcription & translation,  
& allow variation by mutation

What is the difference between a nucleotide and a nucleoside?

Nucleoside = base + sugar

Nucleotide = base + sugar +  $\text{PO}_4^-$





What bases are purines? What bases are pyrimidines?

Purines: Adenine and Guanine

Pyrimidines: Cytosine, Thymine, and Uracil

What is the difference between phosphodiester bonds and hydrogen bonds?

Phosphodiester bonds hold the backbone together using  $PO_4^-$ . Hydrogen bonds connect the bases together



DNA is (negatively/positively) charged. This is caused by the ( $PO_4^-$ /oxygen) bonded to the (nucleoside/nucleotide). Circle the correct answer for each.

A DNA sample from a poison dart frog is found to have 18% cytosine. What is the composition of all other bases in this frog's DNA?

$$A = T$$

$$G = C$$

$$\text{so } 18\% C \text{ and } 18\% G$$

$$18 + 18 = 36$$

$$100 - 36 = 64 \div 2 = 32$$

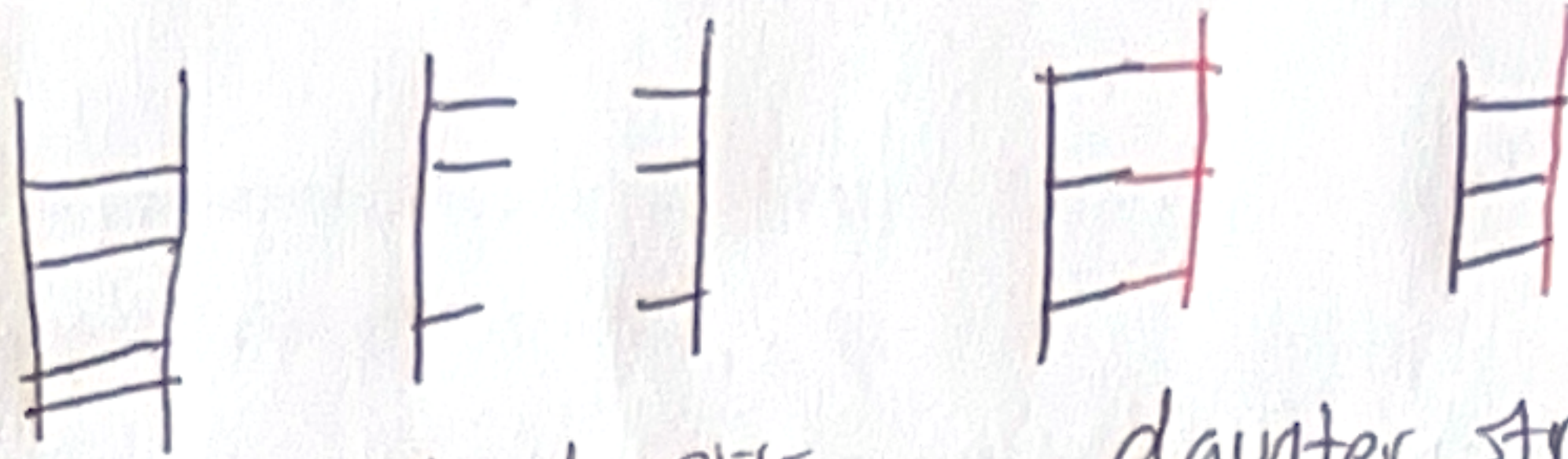
$$\text{so } 32\% A \text{ and } 32\% T$$

Describe (or draw) what Watson and Crick described as the semiconservative model for DNA replication?

They said that a new DNA strand is  $\frac{1}{2}$  old and  $\frac{1}{2}$  a new replicated copy.



Parent strand



strand splits

daughter strands

What is B DNA? Which forms of DNA lack guanine?

B-DNA is the most biologically active

D-DNA and E-DNA lack guanine

Z-DNA is left handed

Describe all 3 classes of RNA:

least

mRNA: copies DNA into a RNA (codon) template

tRNA: brings the most appropriate Amino acid to build a Protein

most

rRNA: ribosomes structure

What is RNA replicase and what is reverse transcriptase?

RNA replicase uses an RNA template to make RNA

reverse transcriptase makes DNA from RNA



List a few reasons why viruses are unique genetically:

- RNA core
- NO nucleus
- less DNA
- uses RNA replicase
- uses reverse transcriptase

DM) AUG 23 2023  
INGREDIENTS Chopped Romaine