ANSWERS NUCLEIC ACID COMPARISON – V4 MHR p 224 – 230

- The 2 nucleic acids are DNA and RNA. Both nucleic acids are polymers made up of repeating units called **nucleotides**. Nucleotides are used for 4 main purposes in an organism:
- To make up the nucleic acids DNA and RNA
- .As chemical messengers to regulate cell activity
- To carry energy as ATP (adenosine triphosphate) and ADP
- To work as coenzymes to speed up chemical reactions

The nucleotides are slightly different in RNA and DNA.

	DNA	RNA
Name	deoxyribonucleic acid	ribonucleic acid
Purpose	- genetically inherited material -contains genetic information to make RNA	- instructions to make a protein
Nucleotide Components	- phosphate (PO_4^{-3}) - deoxyribose sugar (missing an oxygen on the second carbon) - contains the 4 nitrogen bases adenine, **thymine**, guanine, cytosine	- phosphate (PO_4^{-3}) - ribose sugar - contains the 4 nitrogen bases adenine, **uracil**, guanine, cytosine
Number of strands	**double** stranded helix	**single** stranded, not helical but has many other shapes
Location in Cell	Nucleus of eukaryotes (cells with a nucleus) - needs to be protected from pH and enzymes in cytoplasm that can destroy it - Nucleoid of prokayrotes (cells without a nucleus like bacterial cells) - plasmids (circular DNA) of prokaryotes	There are 3 types: - messenger RNA (mRNA) travels between nucleus and cytoplasm - ribosomal RNA(rRNA) in cytoplasm - transfer RNA (tRNA) in cytoplasm

NITROGEN BASE COMPARISON V4 - ANSWERS

The 5 nitrogen bases are adenine, thymine, guanine, cytosine and uracil. They have many similarities and some differences. The nitrogen bases are divided into 2 main categories: **purines,** which have a double ring structure, and **pyrimidines,** with a single ring structure.

	GUANINE	CYTOSINE	ADENINE	THYMINE	URACIL
Found in DNA?	yes	yes	yes	yes	no
Found in RNA?	yes	yes	yes	no	yes
Purine or Pyrimidine?	purine	pyrimidine	purine	pyrimidine	pyrimidine
Number of rings?	2	1	2	1	1
Number of hydrogen bonds?	3	3	2	2	2

2. Put the following particles in order from smallest to largest: chromosome made of DNA, adenine, nucleotide, phosphate, cytosine, hydrogen ion, cell, ribose, nucleus.

3. Explain the difference between a nucleic acid and a nucleotide. Be sure to use an example.

4. Explain the difference between a nucleotide and a nitrogen base. Be sure to use an example.

5. Explain the difference between chromatin and a chromosome. (Gr 11!)