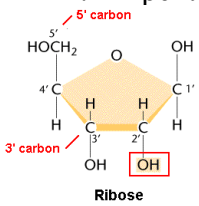
CHAPTER 6 GENETICS BEYOND MENDEL

6.1 DNA AND THE CODE OF LIFE p. 228

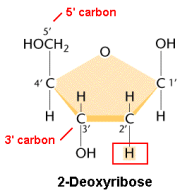
In 1952, why did Hershey and Chase believe that DNA was the hereditary material?

What are the three components of DNA:

1. A pentose sugar (5-carbon, cyclic sugar)



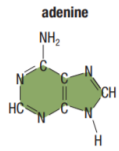
Ribose

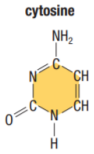


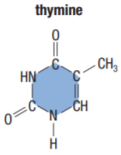
2-Deoxyribose

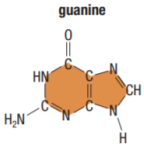
2.

3.


adenine


cytosine


thymine

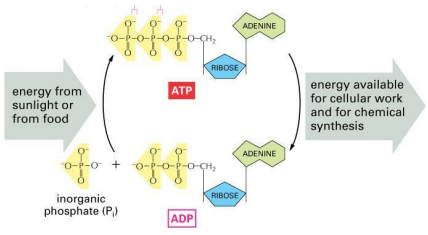

guanine

There are four possible bases. In 1940, Chargaff found that A = __ and G = ___

Look at the structure of the bases above. What do you notice about Chargaff's pairs?

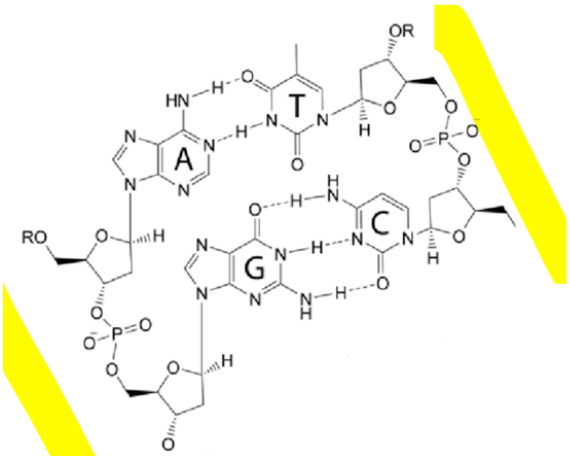
<u>The Structure of the DNA molecule</u>

In _____, Rosalind Franklin's X-ray diffraction of DNA allowed _____ to determine that DNA was a _____-shaped molecule. In 1953, Watson and Crick solved the structure of DNA based on the research of scientists: Levene, Chargoff and Franklin.



ATP is adenosine tri phosphate. It is the energy molecule of the cell.

Take a look at the portion of DNA to the right. It is double-stranded . The lines on the outside highlight the sugar-phosphate repeating backbone of the two DNA



RNA is single-stranded with nucleotides A, U, C, G. It is a copy of DNA for ribosomes to make proteins.

complementary strands since we know if the strand on the left is AG, the strand on the right must be _____.

The two backbones are connect by “hydrogen bonds”.

In grade 9, you learned of two different bonds. Define them:

Ionic bonds

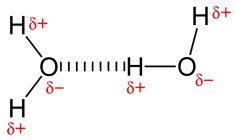
Covalent bonds

Every time you share food with a friend, is the relationship the same? _____. This is the same for atoms that share electrons.

Electronegativity describes the ability of an atom

In general, electronegativity increases from left to right along a period, and decreases descending a group because

Oxygen is more electronegative than hydrogen, so in the covalent bond, electrons are shared _____, resulting in slight charges on these atoms.



Dashed lines connect each pair of nucleotides. A has an N ---- H bond. T has an O ---- H bond.

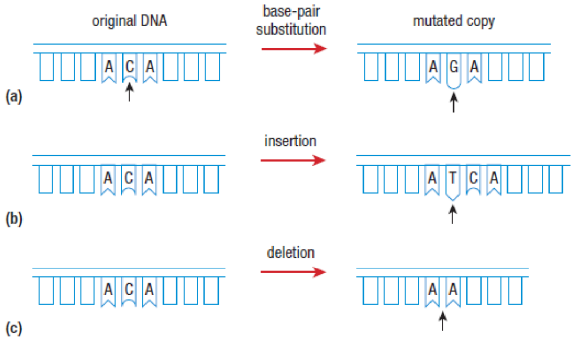
Show the partial charges on the atoms N, H, O, H shown in the bonds above due to their different electronegativities. Add these charges to the diagram at the bottom of page 1. The partial charges are opposite, and opposite charges _____, creating a weak bond, called a hydrogen-bond.

p. 233 #2, 4

6.2 MUTATIONS p. 234

List causes of mutations and types of mutations including insertion, deletion, substitution, point mutations and chromosomal mutations.

Of the three types of mutations depicted to the right, which one would you think would be the most lethal? Explain.

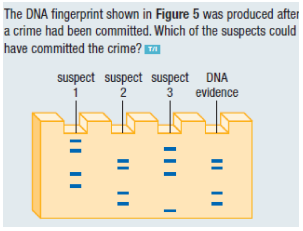


Page 239 #2, 3, 5

6.3 GENOMES p. 240

DEFINE human genome project, coding vs non-coding DNA, model organisms

DNA FINGERPRINTING is



6.4 MANIPULATING THE GENOME p. 245

What is recombinant DNA and why is it useful?

6.5 GENE THERAPY p. 249

What is gene therapy? And *briefly* outline the 3 steps of the process

GENETIC UNIT REVIEW PAGE 268 # 1-4, 6 – 24, 48 – 55, 59 – 61, 63-65, 78