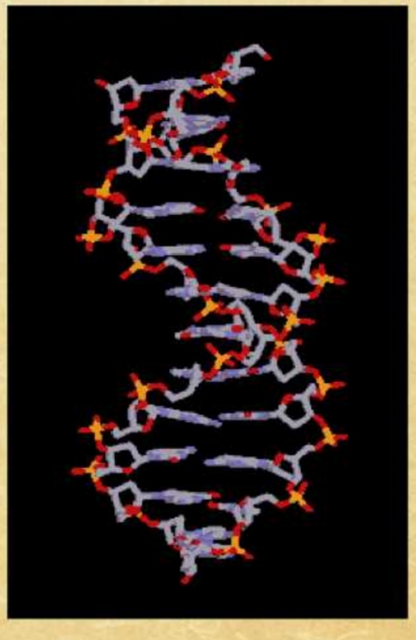
DNA and Chromosomes

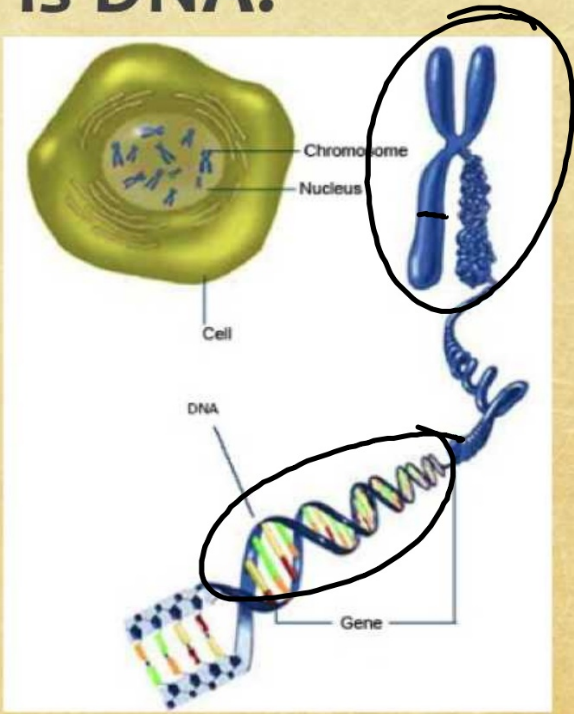
What is DNA?

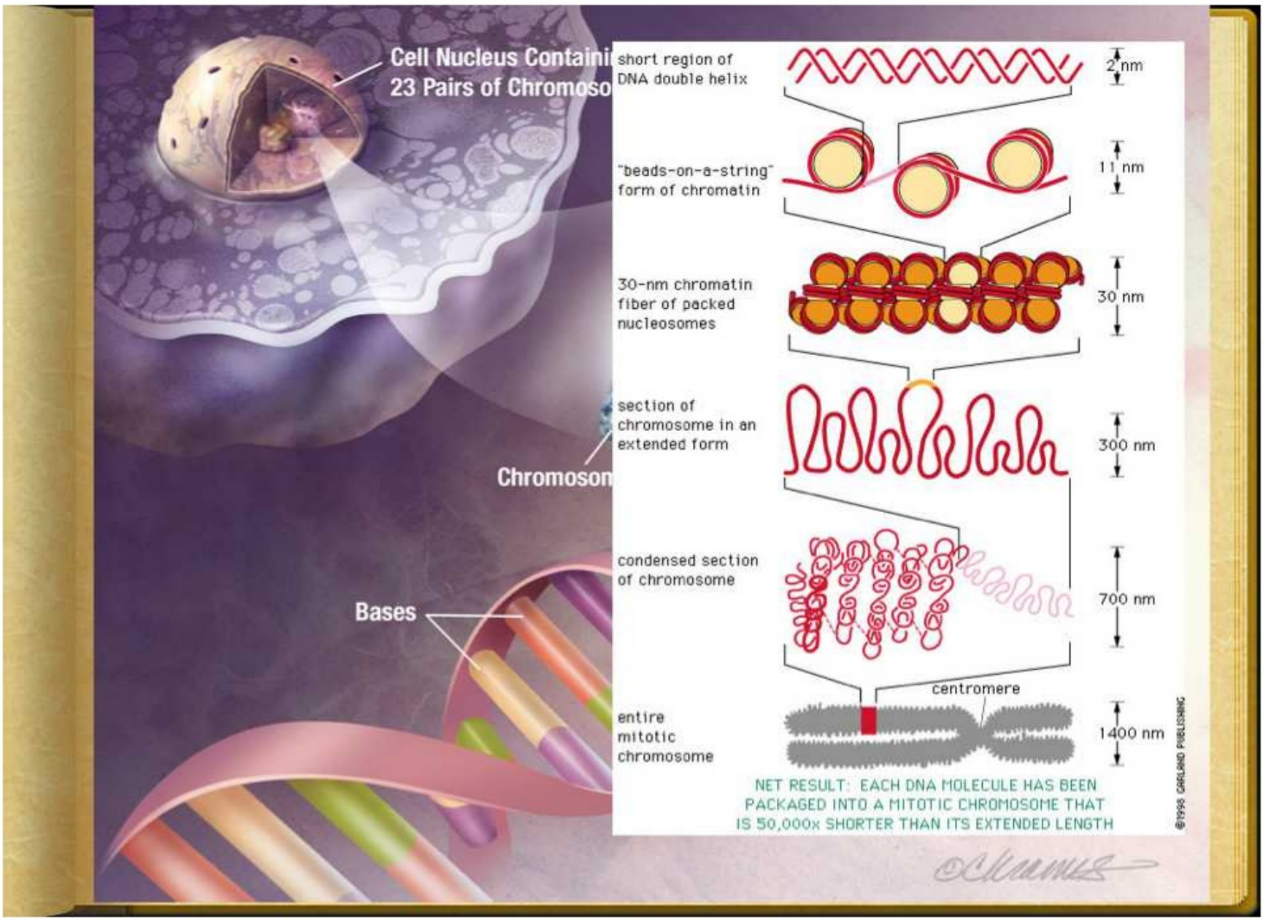
- DNA is where the GENETIC CODE is stored.
- It is a set of instructions for building proteins
- Sent by the CEO to the WORKERS as instructions for building PROTEINS
- Who are the workers?
  - The RIBOSOMES
- Who is the CEO?
  - The NUCLEUS



Where is DNA?

- DNA is found in the NUCLEUS of every cell in every organism.
- DNA is like long string wound up very tightly around itself. When it is wound up it is called a CHROMOSOME.





Cell Nucleus Containi
23 Pairs of Chromoso
Chromoson
Bases
short region of
DNA double helix
2 nm
"beads-on-a-string"
form of chromatin
11 nm
30-nm chromatin
fiber of packed
nucleosomes
30 nm
section of
chromosome in an
extended form
300 nm
condensed section
of chromosome
700 nm
centromere
entire
mitotic
chromosome
1400 nm
NET RESULT: EACH DNA MOLECULE HAS BEEN
PACKAGED INTO A MITOTIC CHROMOSOME THAT
IS 50,000x SHORTER THAN ITS EXTENDED LENGTH
©1998 GARLAND PUBLISHING

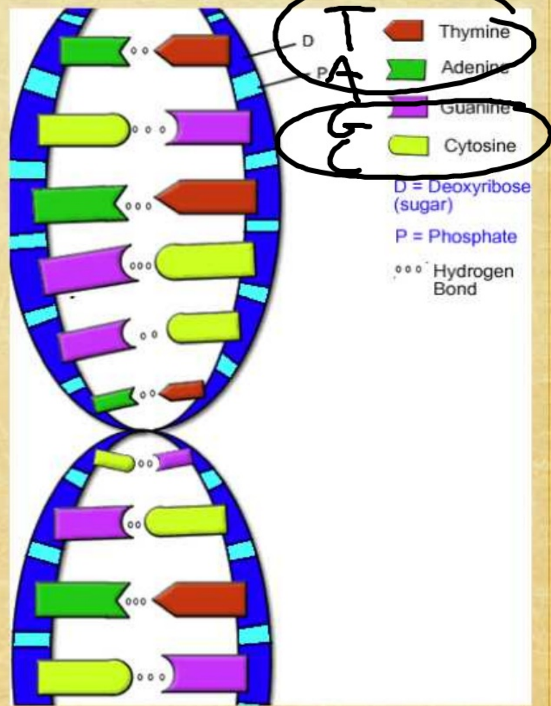
Thymine — Adenine

Guanine

Cytosone

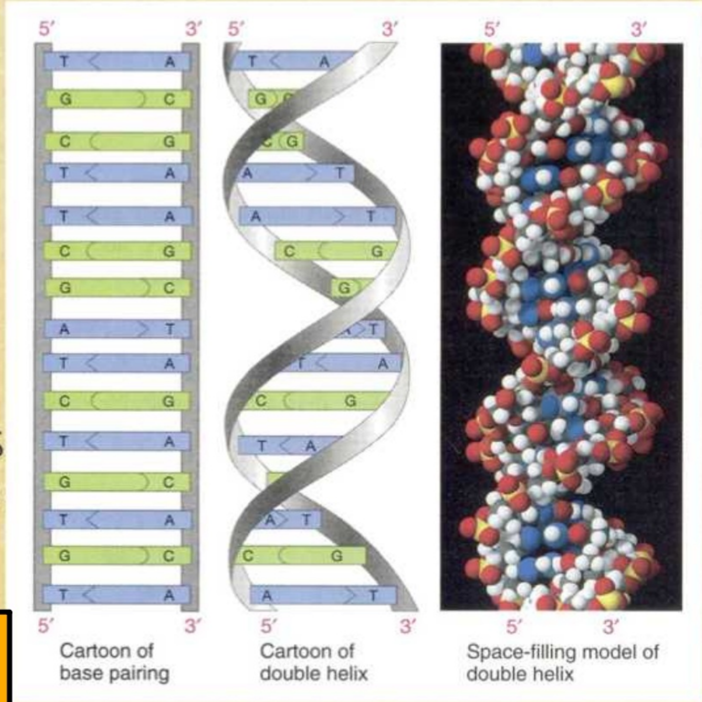
What is DNA made of?

- DNA is shaped like a SPIRAL STAIRCASE.
- The handrails the staircase are made of NUCLEOTIDES.
- The steps of the stair case are made of BASES.
- There are 4 bases used in the DNA molecule, and each pairs with another

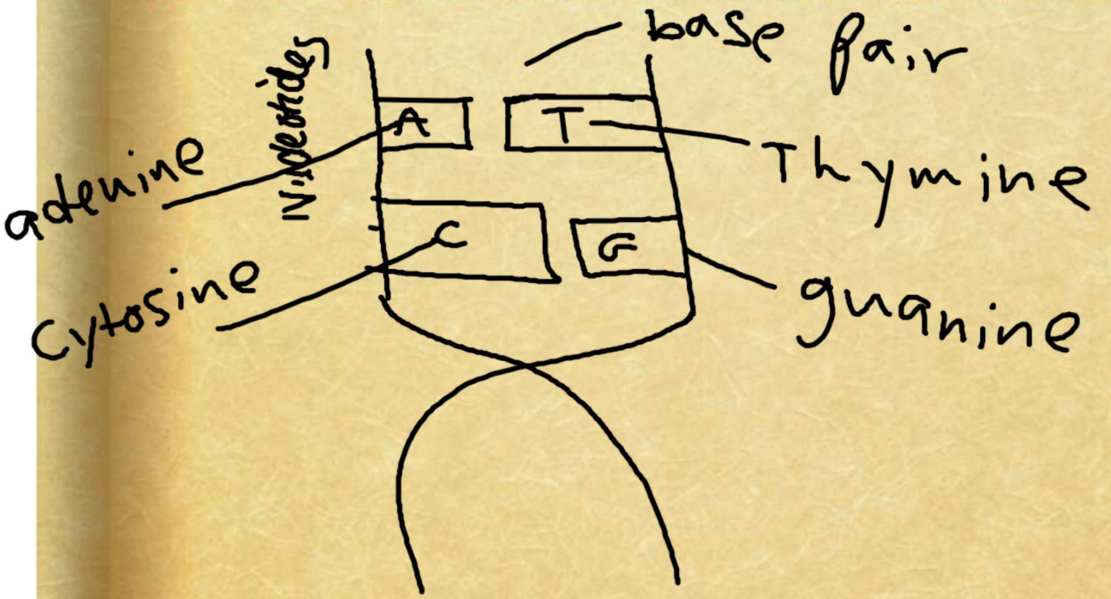


What is DNA made of?

- The NUCLEOTIDES (handrails) give the DNA molecule its structure.
- The BASES (stairs) spell out the GENETIC CODE.
- Remember: DNA is the instructions for how to build proteins. The BASES spell out the words in the instructions.



Draw a DNA molecule and label the Nucleotides and the Bases

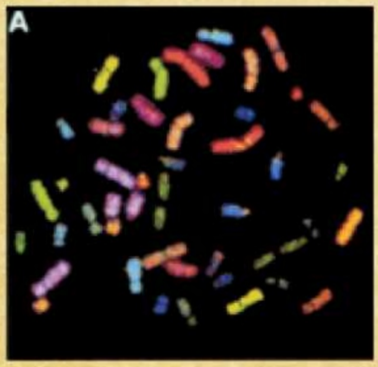


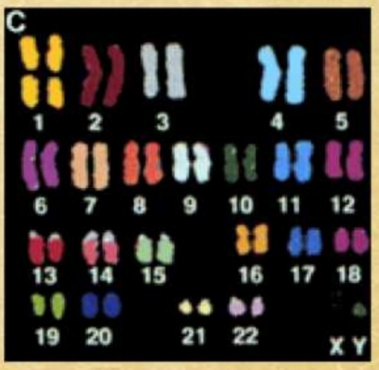
How big is DNA and Chromosomes?

- http://learn.genetics.utah.edu/content/begin/cells/scale/
- http://www.youtube.com/watch?v=qy8dk5iS1f0

Let's review:

- Every cell has a NUCLEUS. The nucleus is the CEO and contains all instructions for building proteins.
- Every nucleus has 23 CHROMOSOMES (in humans)





Let's review:

- Each chromosome is made up of tightly wound DNA.
- DNA looks like a spiral staircase.

- The handrails are made of nucleotides, and give DNA it's shape.
- The stairs are made of bases, and store the genetic code

Exit Slip

- 1) What are the stairs of DNA made of and what purpose do they serve?

stairs = bases (steps)
nucleotides
(handrails)

- 2) Where in the cell is DNA found?

nucleus

- 3) DNA are instructions to build what?

~~Happy~~ proteins