DNA AND LIVING THINGS

How is DNA the foundation of unity and diversity of living things?

KEY TERMS FOR THIS UNIT

- **DNA –**
- **Nucleotide –**
- **Nitrogenous Bases –**
- **Complimentary Bases**
- **Chromosome –**

KEY TERMS FOR THIS UNIT

- **Karyotype –**
- **Species –**
- **Homologous Chromosome –**
- **Gene –**
- **Allele –**

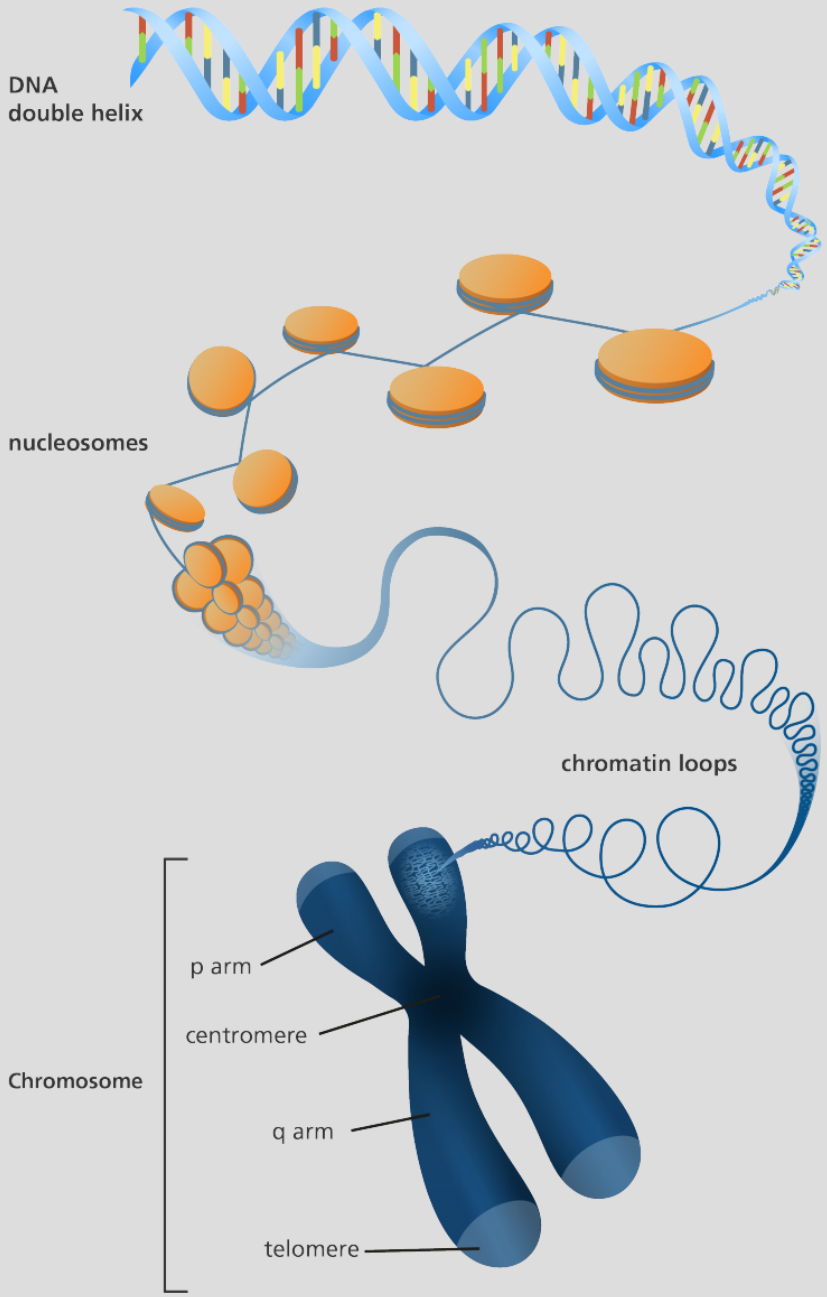
THINK PAIR SHARE

How many different kinds of living things are on Earth? Why do you think diversity is important or valuable?

THINK PAIR SHARE

What do you recall about the structure and function of DNA from last year?

DNA STRUCTURE



CHARACTERISTICS OF LIFE

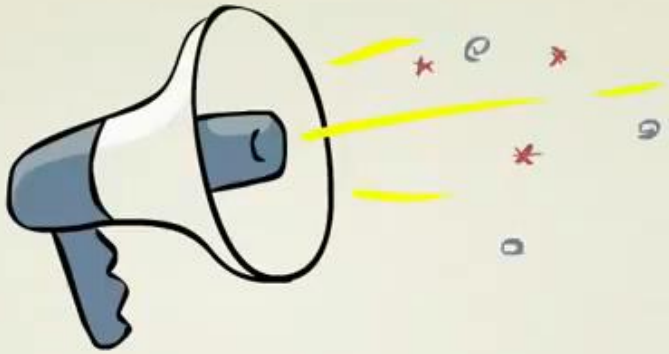
1. Being made up of **cells**
2. Using **energy**
3. **Growing** and changing
4. Reproducing (having **offspring**)
5. Pass **traits** to their offspring (**DNA and RNA)**

WHAT IS GENETICS?

- Genetics is the study of how **inherited** traits are passed on from generation to **generation**
- Traits are passed on to the next generation via **genes** (a section of chromosome that codes for a specific **protein)**
- The genetic code: the chemical **language** that contains the information for **coding** proteins

HEREDITY

The passing on of traits from one generation to the next generation

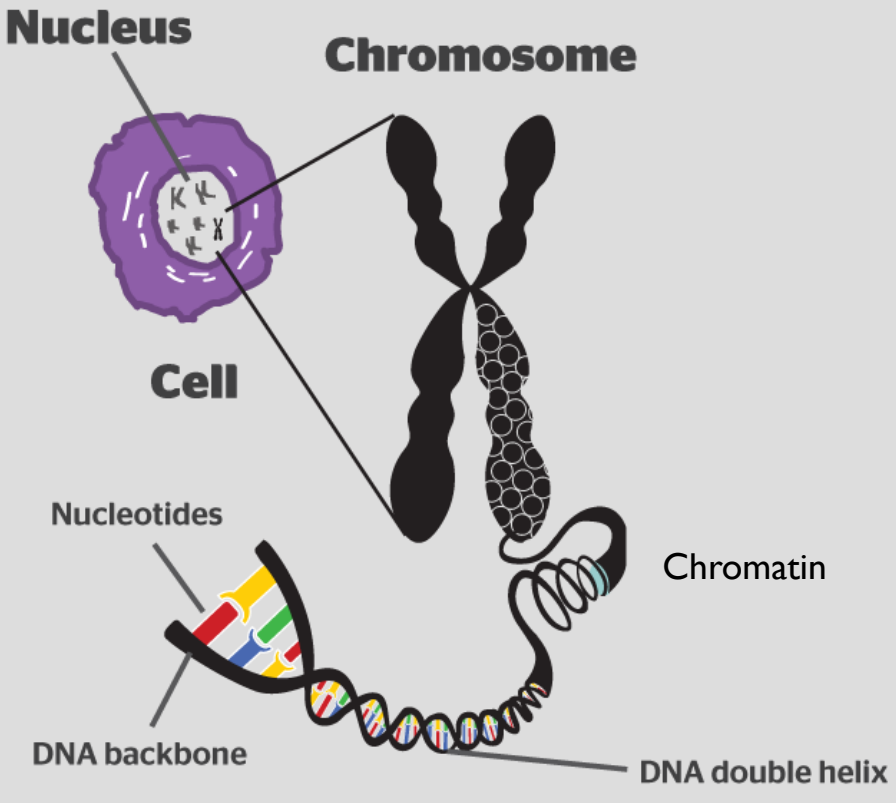


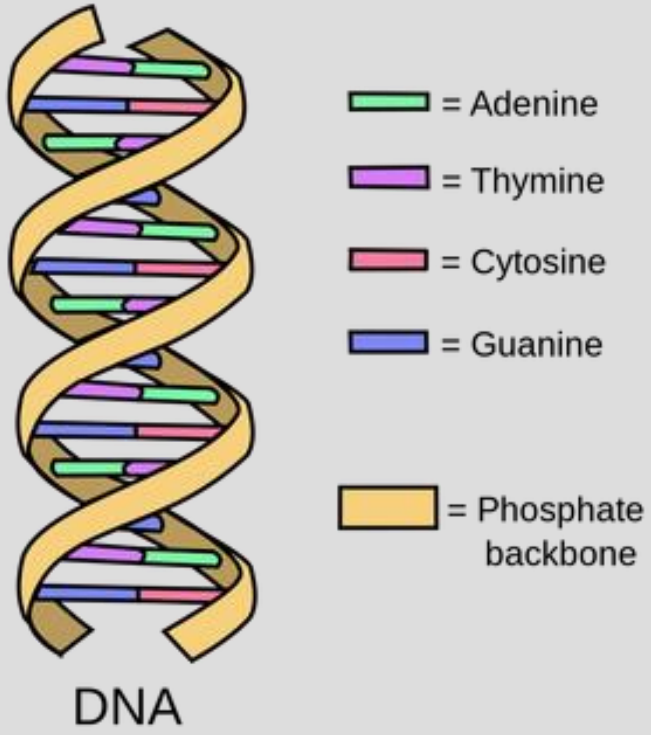
Stated Clearly

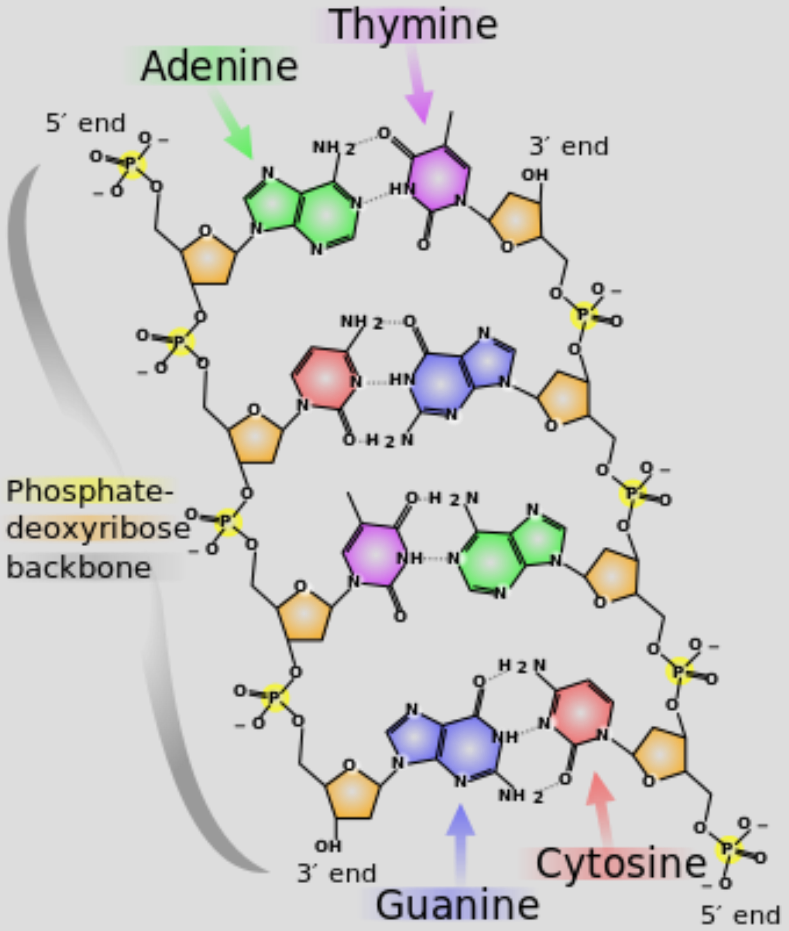
DEOXYRIBONUCLEIC ACID

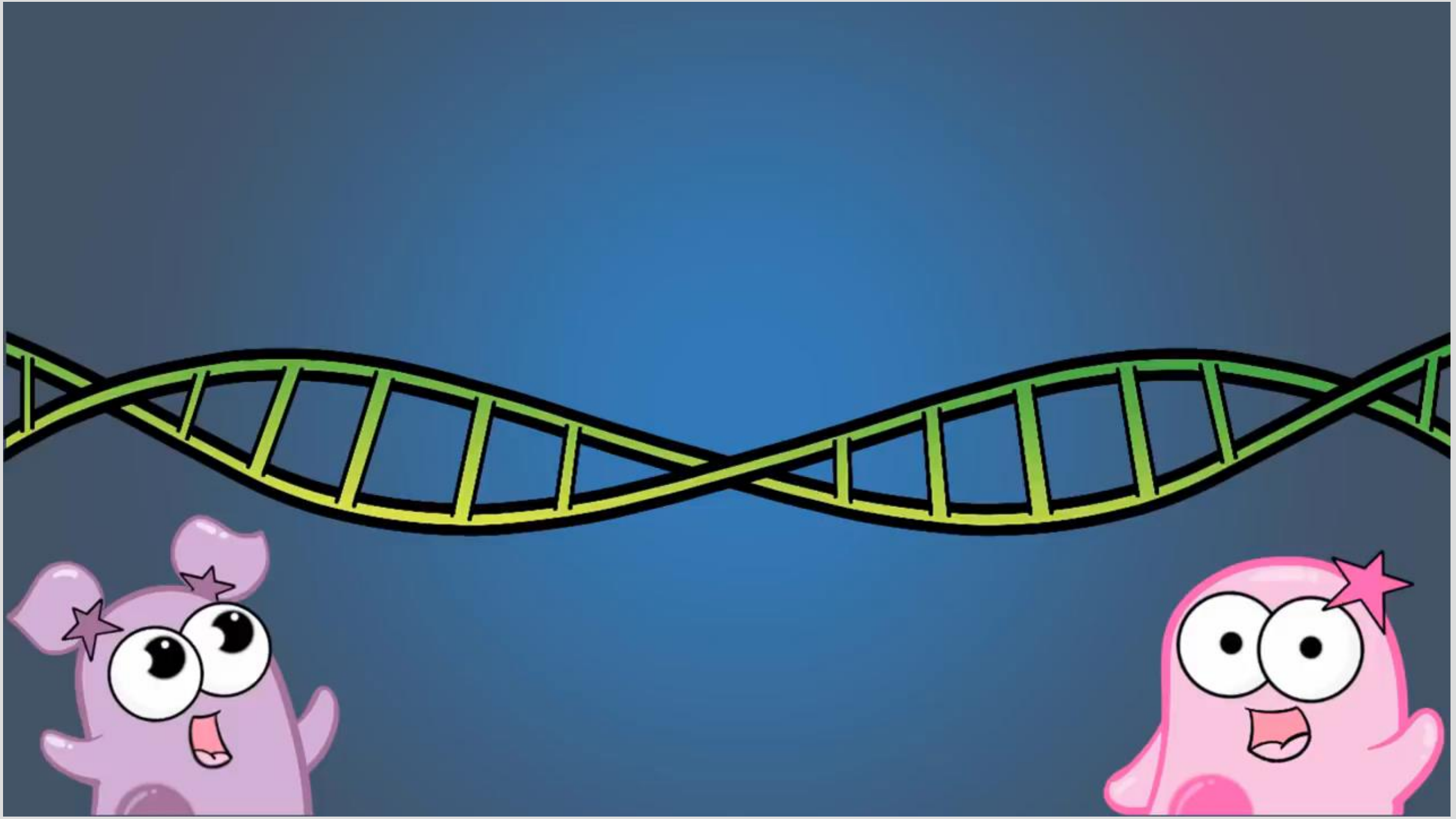
- Aka **DNA**
- All **living things** have DNA
- Genetic material that stores information and contains all the necessary instructions for life
- DNA is responsible for **variation** among all living things
- Most cells of an organism contain genetic information that has **an influence on its appearance and life processes**

STRUCTURE OF DNA



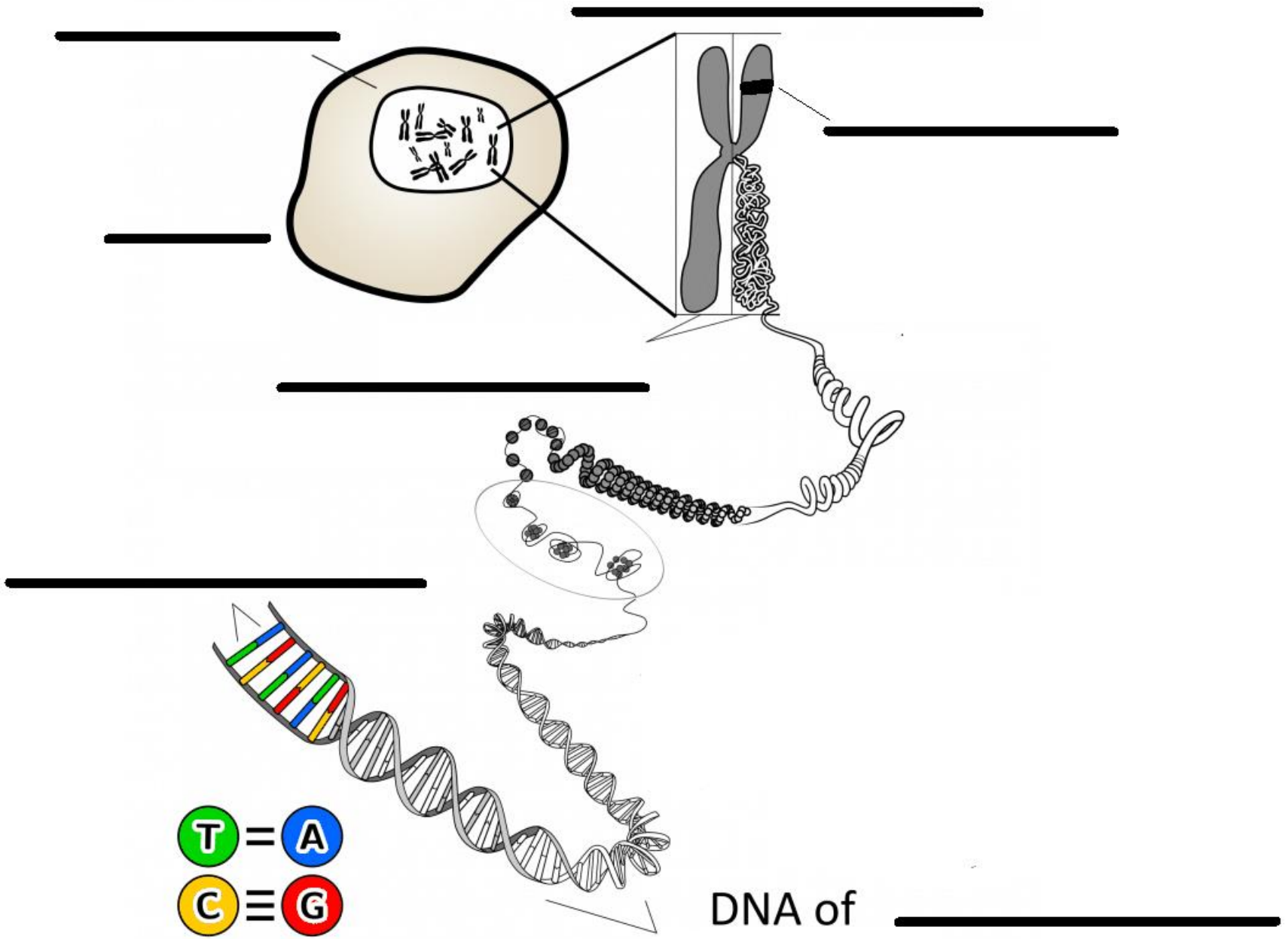






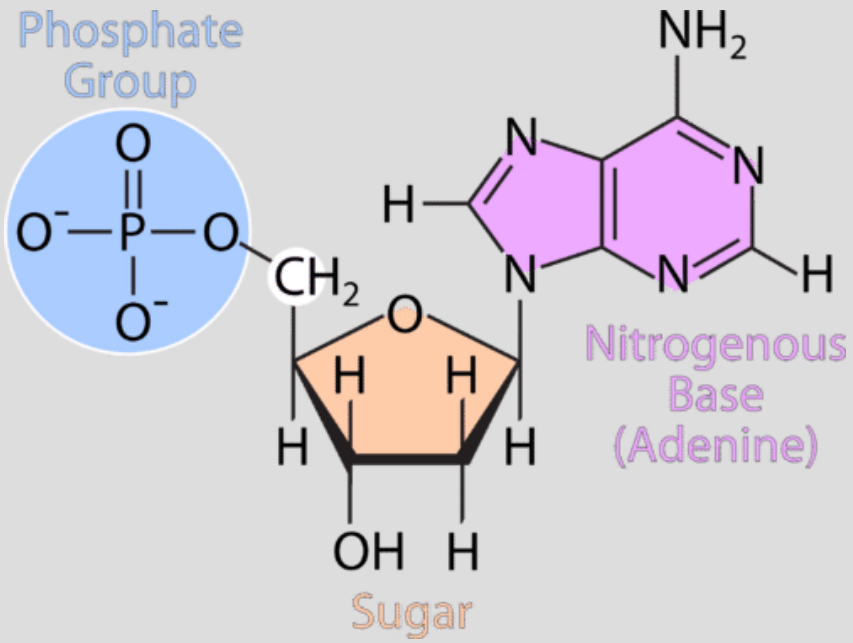
RECALL

- All living things have DNA – **deoxyribonucleic acid**
- DNA exists in long fibres called **chromatin**
- Coiled strand of chromatin is called a **chromosome**
- Genetic material carried in **genes** which are located in the chromosomes


T = A
C ≡ G
DNA of

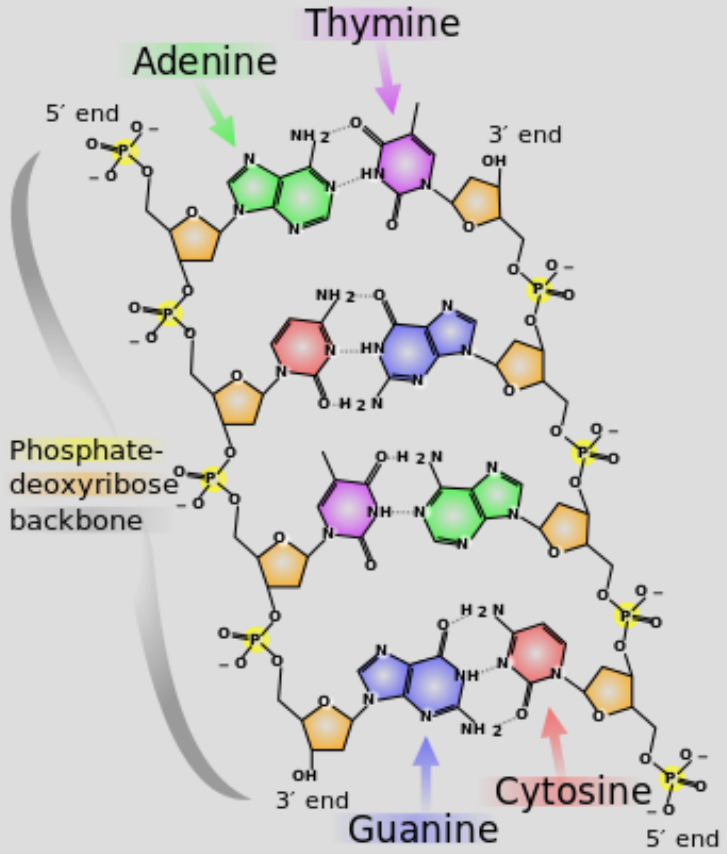
STRUCTURE OF DNA

- Cells contain 2 types of nucleic acids: DNA and RNA
- Nucleic acids are made up of Nucleotides –
  - **Sugar**
  - **Phosphate group**
  - **Nitrogenous base**
- There are 4 nitrogen bases in DNA
  - **Adenine** (A)
  - **Cytosine** (C)
  - **Guanine** (G)
  - **Thymine** (T)



DNA MOLECULE

- DNA is a molecule made up of 2 strands of **nucleotides** linked together
- The sides of the ladder are made of sugar and phosphate groups
- Each rung of the ladder is two nitrogenous bases bonded as **base pairs** and are joined by hydrogen bonds
  - Adenine (A) **<u>always</u>** joins with Thymine (T)
  - Cytosine (C) **<u>always</u>** joins with Guanine (G)
  - When bonded, these are considered complimentary bases
- The twisted structure is called a **double helix** (looks like a twisted ladder)



DRAW AND LABEL