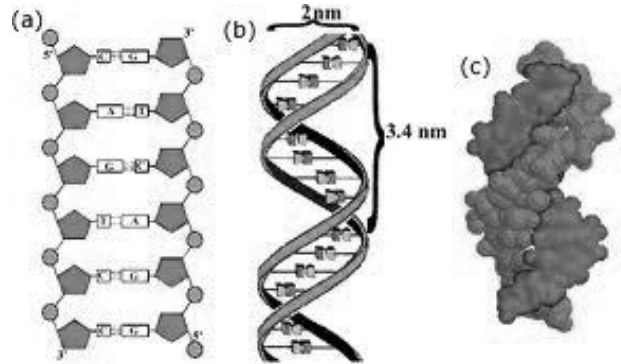


## 1.2 DNA Analysis

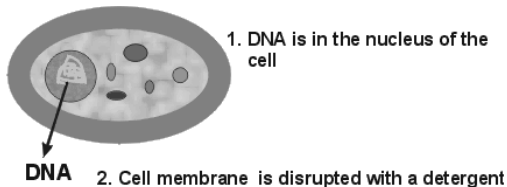
### 1. What is DNA?

- DNA is a double helix structure responsible for inherited traits. It is made from billions of base pairs bonded together to a sugar-phosphate backbone.
  - Which base pairs bond together?
  - What is a nucleotide?
  - Which bases are purines and which are pyrimidines?

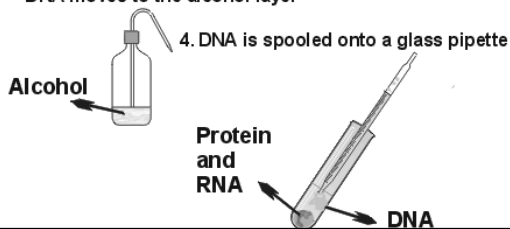


### 2. How do scientists isolate DNA to study it?

- DNA can be extracted from cells by obtaining cells, using detergent to break down the cell and nuclear membranes and adding isopropyl alcohol to separate the DNA from the rest of the cellular materials.



3. Alcohol is added to the tube to separate DNA from other cell components. DNA moves to the alcohol layer



### 3. How does DNA differ from person to person?

- Only the sequence and number of bases separates all organisms.
- Human DNA differs only in the sequence of the bases.
  - Difference between humans of 0.1%.
  - Only identical twins have the same DNA sequence.

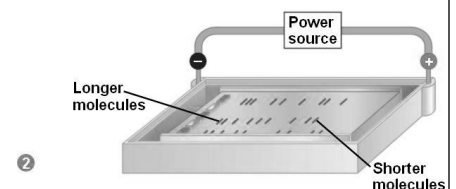
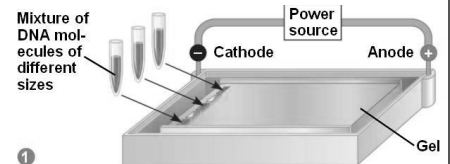
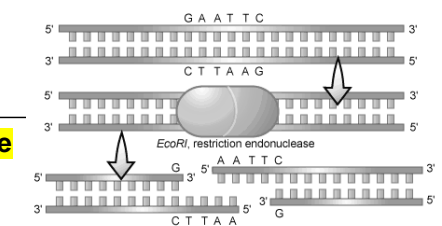
### 4. How can tools of molecular biology be used to compare the DNA of 2 individuals? 5. What are restriction enzymes? 6. What are Restriction Fragment Length Polymorphisms?

- Restriction enzymes come from bacteria and make cuts in DNA.

- If an enzyme cuts between GG and CC, show on the DNA sequence below where the fragments would be.

GGCCGATACAGGCCTAAAGGCCTAC  
CCGGCTATGTCCGGATTTCGGATG

- How many RFLPs are created? List them in order from largest to smallest.



### 7. What is gel electrophoresis and how can the results of this technique be interpreted?

- RFLPs are loaded into a gel electrophoresis.
  - Which direction do the RFLPs move? Why?
  - Which RFLPs will move the farthest? Why?