Biology II

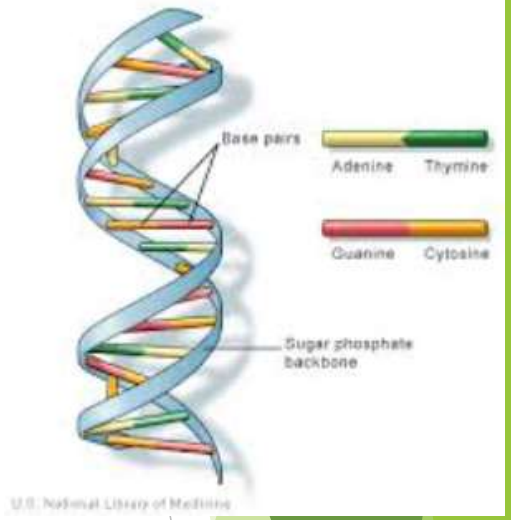
1. Asexual Reproduction
2. Binary Fission

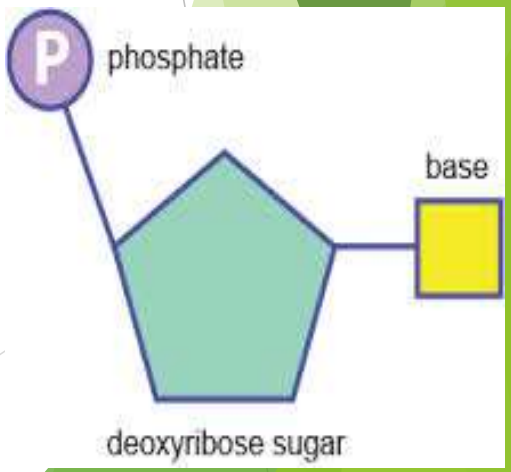
Science 9

Review…

All genetic information within a cell is contained within the DNA of an organism. DNA is considered to be the ‘molecule of life’.

DNA is made up of nucleotides which contain a deoxyribose sugar, phosphate, and a base (adenine, cytosine, guanine, and thymine).





Video

https://www.youtube.com/watch?v=i9zj9V8OWRk&ab_channel=FuseSchool-GlobalEducation

Asexual Reproduction

What is asexual reproduction?

Asexual reproduction occurs when an offspring is produced by only one parent.

The offspring produced is genetically identical to the parent as the parent's genetic information is passed directly onto the offspring.

Advantages of Asexual Reproduction

- Only one parent is needed (no need to find a mate)
- Reproduction occurs quickly
- Offspring mature and start reproduction quickly
- Offspring are genetically identical to the parent
  - Can live and interact with their environment with the same success as their parent

Disadvantages of Asexual Reproduction

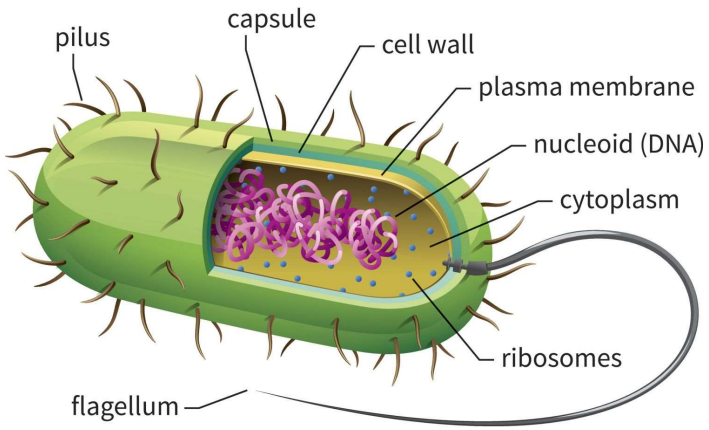
- Lack of genetic diversity
  - All individuals in a population are vulnerable to changes in their environment (example: drought, disease)
  - Since all the individuals are genetically identical, they will all respond in the same way (example: if a sudden change in temperature occurs and the organism cannot adapt, the entire population will die off)

How can bacteria be…

Helpful to us?	Harmful to us?
-	-
-	-
-	-

Bacteria

Bacteria are micro-organisms that exist as single prokaryotic cells. Bacteria reproduce asexually by a process called binary fission.



What is Binary Fission?

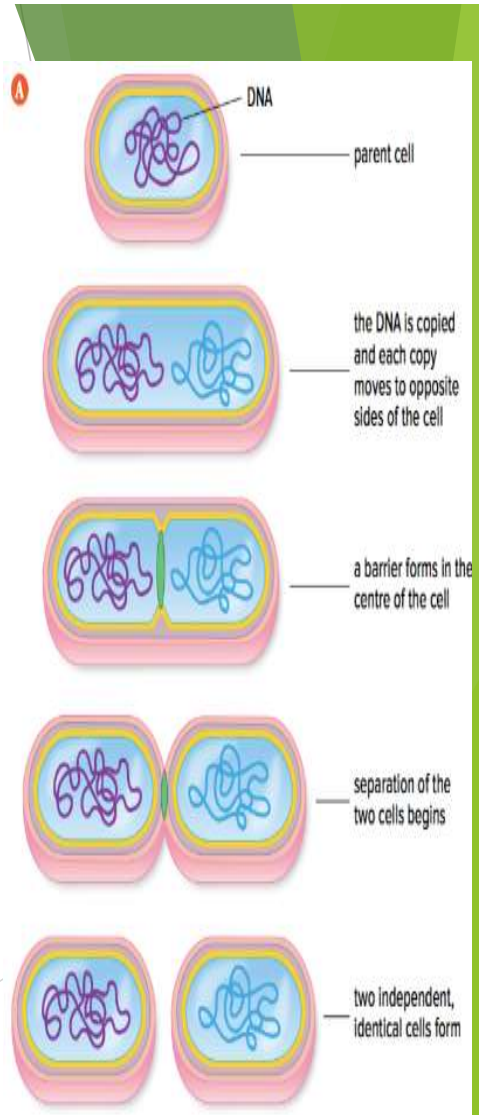
Binary fission is a type of asexual reproduction which occurs in bacteria.

- A parent cell (the original cell) splits into two individual, identical cells (daughter cells)
- Daughter cells have identical genetic information (DNA)

The process of Binary Fission

1. Replication of DNA
   - Bacteria uncoils and replicates its DNA

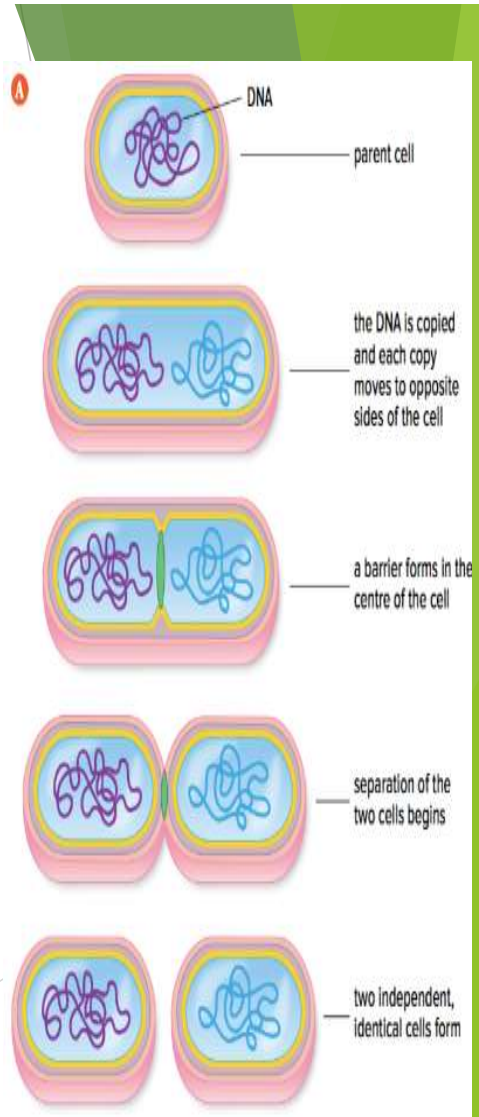
2. Growth of Cell
   - Bacteria begins to grow larger in preparation for binary fission
   - The cytoplasm and number of organelles increase
   - The strands of DNA move to opposite poles (sides) of the cell



The process of Binary Fission

3. Segregation of DNA
   - Cell elongates and a barrier is formed in the middle
   - The two strands of DNA are separated in this phase

4. Splitting of Cells
   - A new cell wall is formed
   - Cell splits in the center and the parent cell gets divided into two new daughter cells
     - Daughter cell: the identical cells that form from the parent cell
   - Each of the daughter cells contain a copy of the replicated DNA and the necessary organelles for the cell's survival



Video

https://www.youtube.com/watch?v=KIpcCyuypzg&ab_channel=SerafinaC