

AP Biology Study Guide—Mitosis, DNA, Meiosis

Sexual reproduction requires that half of the chromosomes in a zygote come from one parent and the other half from the second parent.

- Describe the process by which a germ cell's complement of chromosomes is halved in the formation of gametes.
- Choose **one** organism or group of organisms that reproduce **asexually**. Describe the mode of asexual reproduction in that organism and explain the advantages to the organism of asexual reproduction.
- Choose **one** organism or group of organisms that reproduce **sexually**. Describe the mode of sexual reproduction in that organism and explain the advantages to the organism of sexual reproduction.

Scientists seeking to determine which molecule is responsible for the transmission of characteristics from one generation to the next knew that the molecule must (1) copy itself precisely, (2) be stable but able to be changed, and (3) be complex enough to determine the organism's phenotype.

- **Explain** how DNA meets each of the three criteria stated above.
- Select **one** of the criteria stated above and **describe** experimental evidence used to determine that DNA is the hereditary material.

Discuss the process of cell division in animals. Include a description of mitosis and cytokinesis, and of the other phases of the cell cycle. Do not include meiosis.

Describe the structure and function of the eukaryotic chromosome.

Explain the evolutionary significance of organizing genes into chromosomes.

Describe the prokaryotic chromosome how does this chromosome differ from eukaryotes.

How is the mutation rate in DNA decreased when replication is complete?

Explain the cell cycle and how the cell cycle is controlled. (Identify the various checkpoints and explain how intracellular signals control the cell cycle)

Identify parts of DNA molecule. (phosphate group, sugar, bases, phosphodiester bonds, hydrogen bonds, nucleotide.)

Explain Griffith's experiment.

Explain Avery, MacCleod and McCarty's experiment.

The role of all the enzymes/proteins involved in DNA replication.

Diploid/haploid

Effect of cancer on cell cycle

Explain how the events in Meiosis increase genetic diversity.

Chromosomal mutations (duplication, deletions, translocation, inversion or nondisjunction)

In Polymerase Chain Reaction (PCR), how does heat effect the DNA?

Read about MPF—we talked about the maturation (mitosis) promoting factor—refresh your memory.

Leading and Lagging strand replication.

Read up on Platelet Derived Growth Factor (PDGF)

What is the role of topoisomerase?

Chi square—review the examples from class (onion root tips and skittles)

Standard Deviation