

## Biology Final Exam Topic List

**These are the topics that you need to know for the Biology Final Exam (This is the actual guide that we used to write the exam)**

Topics for the final:

Cell Cycle

a. The cell cycle is a process that results in somatic cells the same as the parent cell.
b. Mitosis (division of the nucleus) and cytokinesis (division of the cytoplasm)
c. produces body cells
d. process of chromosome change and movement but no phase names
e. not all cells reproduce

Meiosis

a. Crossing over
b. Produces gametes (sperm and egg)
c. 4 different cells produced
d. cells produced have half the number of chromosomes
e. regular body cell # of chromosomes is restored at fertilization
f. the importance of variation

Molecular Genetics

a. significance of DNA in protein synthesis
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b. comparison of function of DNA and mRNA
c. comparison of structure of DNA and mRNA
d. DNA and RNA made of Nucleotides
e. DNA is a double helix made of A-T and C-G
f. Relationship between DNA / RNA / protein
Replication, transcription, translation - definition and do it!
Role of mRNA and tRNA
i. Mistakes made in the process - Mutation (mutations must be in sex cell to be passed on)

Mendelian Genetics

a. Big idea - Patterns of inheritance (dominant, recessive, alleles are paired chromosomes)
b. Relationship between genes on chromosomes and DNA
c. Information the genes store makes them important
d. Probability
e. Do a one trait cross (monohybrid) and answer question

Human Genetics

a. Karyotype – How to interpret one
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Linked genes/sex-linkage - colorblindness or hemophilia
X-sex linked disease shows more often in males
d. Pedigree — tests patterns of inheritance
e. DNA fingerprinting - tool to ID individuals
Blood types-multiple alleles-
g. Non-disjunction of chromosomes causes diseases (When does it happen)

Evolution

a. Change over time
b. Darwin and Natural Selection
c. Question on Simulation of Natural Selection
d. Changes in populations over time
e. Evidences for evolution — old earth, changes in earth, fossil record, DNA, homologous structures)
f. Speciation
g. Mutations are random in a population and could give organisms an advantage or disadvantage

## Population Biology (Ecology)

a. Shift in a population over time

b. understand how two organisms in the same ecosystem each affects the other

c. Carrying capacity

d. Competitive exclusion (one organism pushes another out, only one organism can occupy one niche)

## Succession –

a. why succession happens

b. primary and secondary species (what comes first... second)

c. stable community (describe)

## Biodiversity

a. more diversity in ecosystem = healthier ecosystem

## Classification

a. Why do we classify?

b. Scientific vs common names (why use scientific name?)

c. How are living things classified?