

Due dates:
(by end of class)

Period 1,3,5,7 – Mon. June 3
Period 4, 6 – Tues. June 4

Study Guide - CP Biology Spring Final Exam

The final will be a comprehensive exam, covering all the information we have studied since the beginning of the semester. You will need to use your notes, homework, labs, and textbook to review the material. The focus on this test will be applying your knowledge. It is not enough just to memorize vocabulary; you need to understand the concepts and how they apply in different situations. Use this study guide to take notes and direct your review time. The study guide is due the day before the last class period before your final exam and will be your last official homework assignment for a grade (+30 points). The final exam will be CLOSED NOTE/BOOK, therefore be sure to study!

Topics and Chapters

Unit 1: Genetics – Chapters 5.1, 5.2, 6.1 -- 6.6, 7.1 -- 7.4. 8.1 – 8.5, 8.7

Unit 2: Evolution – Chapters 10.3, 10.4, 11.1--11.3, 11.5, 12.1

Unit 3: Ecology – Chapters 13 and 14

Unit 1 – Genetics/DNA

Vocabulary – cell cycle, mitosis, meiosis, chromosome, centromere, homologous chromosome, fertilization, genotype, phenotype, allele, gene, homozygous, heterozygous, nucleotides, ribosome, tRNA, mRNA, rRNA, DNA polymerase, codon, anti-codon, carrier, epistatic gene

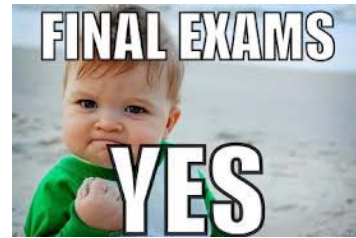
- ⇒ Practice reading and interpreting pedigrees for both sex-linked and autosomal genes
- ⇒ Describe how sex linked traits are inherited and why they are observed more in males (review Thomas Morgan's experiment)
- ⇒ How are blood types inherited? Describe the genotypes and phenotypes for each blood type and be able to determine probabilities.
- ⇒ Define homozygous and heterozygous.
- ⇒ Explain the difference between dominant alleles and recessive alleles.
- ⇒ Be able to determine probabilities for monohybrid crosses and convert into actual numbers of offspring. *Review Punnett Square worksheets completed for Chs. 6 and 7.*
- ⇒ What happens in meiosis that creates genetic variations (think about changes in chromosomes)?
- ⇒ What are some ways DNA/genes can be affected by the environment? What are factors that affect gene expression?
- ⇒ Describe the process of crossing over. When and where does it occur? How does the process relate the Mendel's law of independent assortment?
- ⇒ Explain the central dogma of molecular biology (DNA, RNA, protein synthesis).
- ⇒ Describe the structure of the DNA molecule in detail.
- ⇒ Explain the process of DNA replication and where it occurs in the cell
- ⇒ What is the base pairing rule and how do nucleotides in DNA pair up? How is it different in RNA?
- ⇒ Describe the difference between DNA and RNA in detail.
- ⇒ Summarize the function of **each** stage of protein synthesis (transcription and translation).
- ⇒ Explain the function of stop codons and start codons.
- ⇒ Identify and describe the molecules involved in translation.
- ⇒ In what part of the cell and how often does transcription occur? What molecules are involved?

Unit 2 – Ecology

Vocabulary – ecology, community, ecosystem, biome, biotic/abiotic factors, keystone species, producer, consumer, food chain, food web, biogeochemical cycle, specialist, generalist, heterotroph, autotroph, biomass and energy pyramid, habitat, ecological niche, symbiosis, survivorship curve, exponential growth, carrying capacity, succession, pioneer species

- ⇒ Explain the difference between abiotic and biotic factors. Identify them in an ecosystem and how they are important
- ⇒ Know the types of symbiosis, examples, and effects on the ecosystem
 - commensalism
 - parasitism
 - mutualism

- ⇒ Analyze the types of succession that occur in environments, explain when and why each occurs
 - primary succession
 - secondary succession
 - pioneer species
 - climax community
- ⇒ Define and understand
 - habitat vs. niche
 - population vs. community
 - species and keystone species
 - carrying capacity
 - herbivore, carnivore, omnivore, detritivore
 - interspecific vs. intraspecific competition
 - heterotroph vs. autotroph
 - emigration vs. immigration
- ⇒ Evaluate the relationship between predator and prey.
- ⇒ Explain the different trophic levels and types of organisms found in each.
- ⇒ Explain the difference between a food web and a food chain.
- ⇒ Describe an energy pyramid, a pyramid of numbers, and what they illustrate about ecosystems.
- ⇒ Explain the nitrogen cycle and the role of bacteria, the steps of the hydrologic cycle, and the carbon cycle.



Unit 3 – Evolution

Vocabulary: adaptation, speciation, variation, gene pool, gene flow, vestigial structure, mutation, reproductive isolation, genetic drift, artificial selection, population, fitness

- ⇒ Explain and apply the concept of natural selection.
- ⇒ Know and define the four main principles of natural selection.
- ⇒ Know the evidences for evolution in Darwin's time (four of them).
- ⇒ Evaluate how the fossil record, homologous structures, vestigial structures and DNA sequences (molecular evidence) provide evidence for evolution – know examples of all
- ⇒ Explain why genetic variation is beneficial, how it's stored and measured. What are the two main sources?
- ⇒ Identify and describe the 3 *pathways* of natural selection that occur.
- ⇒ Define and explain how gene flow works. What happens when it is limited? What happens when there is a lot of it?
- ⇒ Define and explain how genetic drift works. What is a bottleneck effect? Founder effect? Negative effects?
- ⇒ Define sexual selection. What is intrasexual selection? What is intersexual selection?
- ⇒ What was the significance of Darwin's observations regarding finches and tortoises on the Galapagos?
- ⇒ Explain the idea of 'survival of the fittest'.
- ⇒ Explain how geographic isolation leads to reproductive isolation and speciation (define all terms).

Textbook Review Questions: Complete the following review questions from your book.

- CH 5 – page 159: Visualizing Vocabulary (all), Main Ideas #11, 15, 16
- CH 6 – page 195: Main Ideas #12, 13, 14, 17, 20
- CH 7 – page 221: Main Ideas #9, 10, 11, 12, 17, 18, 19
- CH 8 – page 259: Main Ideas #11, 12, 13, 15, 16, 18, 19,
- CH 10 – page 323: Main Ideas #13, 14, 16, 17
- CH 11 – page 355: Main Ideas # 13, 14, 19, 20
- CH 13 – page 423: Main Ideas #12, 13, 16, 20
- CH 14 – page 451: Main Ideas #12, 13, 15, 22