GENERAL

ap biology vocabulary list

Published: September 19, 2026 | Index ID: #-

Mastering the AP Biology Vocabulary List: Your Ultimate Study Companion

Every high school student who dreams of a science focused college degree or a career in research knows that the Advanced Placement (AP) Biology exam is a rigorous test of both conceptual understanding and technical language. Unlike many other AP subjects, biology's success hinges on a solid grasp of the discipline's specific terminology. Whether you're a first time AP student or a seasoned exam taker looking to fine tune your knowledge, this comprehensive guide to the AP Biology vocabulary list will give you the tools you need to ace the exam.

Why Vocabulary Matters in AP Biology

Biology is a language of its own. The exam's multiple choice and free response questions are written in precise scientific language that assumes familiarity with terms like **homeostasis**, **mitotic spindle**, or **ecological niche**. A strong command of these words not only helps you decode the questions but also signals to the examiners that you understand the underlying concepts. In fact, the College Board's own scoring rubric emphasizes the importance of accurate terminology in the free response section. Mastering the AP Biology vocabulary list is therefore not just a "nice to have" skill; it is a prerequisite for success.

How the AP Biology Exam Uses Vocabulary

The AP Biology exam is divided into two sections:

1. Multiple Choice (60 questions, 90 minutes) – Questions are often worded in a way that tests your ability to parse scientific definitions and apply them to real world scenarios.
2. Free Response (7 questions, 60 minutes) – These require you to explain processes, draw diagrams, and use technical language to describe mechanisms.

In both sections, the examiners look for correct usage of key terms. For example, if a question asks you to describe the role of the **mitochondrion** in cellular respiration, using the word "oxidative phosphorylation" correctly will earn you points that a vague explanation would not.

Organizing Your Vocabulary Study

Because the AP Biology syllabus covers a vast array of topics, it's helpful to break the vocabulary into thematic categories. Below is a suggested framework that aligns with the course's major units:

- Cellular Structure & Function
- Genetics & Molecular Biology
- Evolution & Ecology
- Physiology & Homeostasis
- Biotechnology & Bioethics

Within each category, you'll find a curated list of essential terms, each accompanied by a concise definition. When studying, aim to learn the term, definition, and an example of how it appears in a biological context.

Cellular Structure & Function

Key Terms and Definitions

- Cell membrane – A phospholipid bilayer that regulates the movement of substances into and out of the cell.
- Chloroplast – An organelle found in plant cells where photosynthesis occurs.
- Endoplasmic reticulum (ER) – A network of membranes involved in protein synthesis (rough ER) and lipid metabolism (smooth ER).
- Golgi apparatus – Processes, sorts, and packages proteins for transport within or outside the cell.
- Microtubule – Cytoskeletal component that provides structural support and facilitates intracellular transport.
- Vacuole – A membrane‑bound organelle that stores nutrients, waste products, and maintains turgor pressure.
- Ribosome – A complex of RNA and protein that translates mRNA into polypeptide chains.
- Peroxisome – Contains enzymes that detoxify hydrogen peroxide and metabolize fatty acids.
- Flagellum – A whip‑like appendage that propels many bacteria and sperm cells.
- Centrosome – The main microtubule organizing center, crucial for cell division.

Practical Study Tips

1. **Flashcards**– Create a set of digital or paper flashcards. On one side write the term; on the other, the definition and an example sentence. Use spaced repetition software (Anki, Quizlet) to reinforce memory.

2. **Visual Aids**– Draw labeled diagrams of a typical animal cell and a plant cell. Highlight each organelle and write a short description beside it.

3. **Mnemonic Devices**– For instance, to remember the order of the mitochondria's electron transport chain complexes, use the phrase "Some People Like Mice, But Others Prefer Cheese." (S = Complex I, P = Complex II, etc.)

Genetics & Molecular Biology

Essential Vocabulary

- Allele – One of two or more versions of a gene that occupy the same locus on homologous chromosomes.
- Dominant – An allele that masks the expression of another allele in a heterozygote.
- Recessive – An allele whose phenotypic effect is hidden in a heterozygote.
- Genotype – The genetic makeup of an organism.
- Phenotype – Observable characteristics resulting from the interaction of genotype and environment.
- Homologous chromosomes – Paired chromosomes that carry the same genes but may have different alleles.
- Heterozygous – Having two different alleles at a locus.
- Homozygous – Having two identical alleles at a locus.
- Chromosome – A threadlike structure composed of DNA and protein that carries genetic information.
- DNA replication – The process by which a cell duplicates its DNA before cell division.
- Transcription – The synthesis of RNA from a DNA template.
- Translation – The synthesis of proteins from mRNA using ribosomes.
- Codon – A three‑nucleotide sequence in mRNA that specifies an amino acid.
- Anticodon – The complementary three‑nucleotide sequence on tRNA that pairs with a codon.
- Mutagen – Any agent (chemical, radiation, or biological) that increases the frequency of mutations.
- Gene expression – The process by which information from a gene is used to produce functional gene products such as proteins.
- RNA polymerase – Enzyme that synthesizes RNA from a DNA template.
- Promoter – DNA sequence upstream of a gene that signals the start of transcription.
- Enhancer – DNA sequence that can increase the transcription of a gene, often located far from the gene itself.
- Silencer – DNA sequence that represses transcription of a gene.

Study Strategies for Genetics

1. **Practice Punnett Squares**– Draw Punnett squares for monohybrid, dihybrid, and polygenic crosses to reinforce the application of dominance and recessiveness.

2. **Build a Gene Map**– Create a visual representation of genes on a chromosome, noting their relative positions and distances (measured in centimorgans).

3. **Relate to Real World Examples** Use traits like flower color in pea plants or human blood types to illustrate concepts like codominance and incomplete dominance.

Evolution & Ecology

Key Evolutionary Terms

- Natural selection – The process by which traits that improve survival and reproduction become more common in successive generations.
- Adaptation – A trait that enhances an organism's fitness in a particular environment.
- Phylogeny – The evolutionary history and relationships among species.
- Homology – Similarity in structure due to shared ancestry.
- Analogous – Similarity in function but not due to common ancestry.
- Speciation – The formation of new and distinct species in the course of evolution.
- Cladistics – A method of classifying organisms based on shared derived characteristics.
- Biogeography – The study of the distribution of species and ecosystems in geographic space and through geological time.
- Ecosystem – A community of living organisms interacting with their physical environment.
- Biodiversity – Variety and variability of life on Earth.
- Keystone species – A species that has a disproportionately large effect on its ecosystem relative to its abundance.
- Food chain – A linear sequence of organisms each of which serves as food for the next.
- Food web – A network of interconnected food chains.
- Carrying capacity – The maximum number of individuals of a species that an environment can sustainably support.
- Population genetics – The study of genetic variation within populations and how it changes over time.

Ecological Vocabulary Highlights

- Producer – Organism that produces its own food via photosynthesis or chemosynthesis.
- Consumer – Organism that obtains energy by eating other organisms.
- Decomposer – Organism that breaks down dead organic material, recycling nutrients.
- Symbiosis – Long term interaction between two different species.
- Mutualism – Symbiosis in which both species benefit.
- Commensalism – One species benefits while the other is neither helped nor harmed.
- Parasitism – One species benefits at the expense of the other.
- Succession – The process by which an ecosystem changes over time.
- Habitat – The natural environment in which an organism lives.
- Niche – The role or function of an organism within its ecosystem.

Effective Learning Techniques

1. **Create a Concept Map**– Connect evolutionary concepts like adaptation, natural selection, and speciation to illustrate their interdependence.

2. **Analyze Case Studies**– Study classic examples such as Darwin's finches, antibiotic resistance, and the

Galápagos tortoise to see how vocabulary terms apply in real contexts.

3. **Use Interactive Simulations**– Platforms like PhET and iNaturalist offer simulations that allow you to manipulate variables and observe ecological dynamics.

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