

Texas Tenth Grade Science Guidelines Checklist

Biology

(Aligned with TEKS Chapter 112.34 – Biology, Adopted 2021, Effective 2024–2025)

Scientific and Engineering Practices

- ☐ Ask questions and define problems using scientific methods.
- ☐ Plan and conduct investigations using appropriate tools and technology.
- ☐ Analyze and interpret data to identify patterns.
- ☐ Develop and use models to explain phenomena.
- ☐ Construct explanations and design solutions.
- ☐ Engage in argument from evidence.
- ☐ Communicate scientific ideas effectively.
- ☐ Use mathematical and computational thinking in science.
- ☐ Obtain, evaluate, and communicate information.

Biology Concepts

Cells and Cellular Processes

- ☐ Identify the structure and function of major cell organelles.
- ☐ Compare prokaryotic and eukaryotic cells.
- ☐ Explain homeostasis and cell transport (osmosis, diffusion, active transport).
- ☐ Investigate the stages of the cell cycle, including mitosis.
- ☐ Describe how viruses differ from cells and how they affect living organisms.

Biomolecules and Energy

- ☐ Identify the structure and function of biomolecules (carbohydrates, proteins, lipids, nucleic acids).
- ☐ Explain the role of enzymes in biological processes.
- ☐ Describe photosynthesis and cellular respiration, including reactants and products.
- ☐ Compare aerobic and anaerobic respiration.

Genetics and Heredity

- ☐ Describe Mendel's laws of inheritance.
- ☐ Use Punnett squares to predict genotypes and phenotypes.
- ☐ Describe DNA structure and function.
- ☐ Explain the process of protein synthesis (transcription and translation).



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- ☐ Describe the effects of genetic mutations.
- ☐ Explore patterns of inheritance in humans and other organisms.

Evolution and Natural Selection

- ☐ Explain the theory of natural selection.
- ☐ Analyze evidence of common ancestry (fossils, embryology, DNA).
- ☐ Describe how populations evolve over time.
- ☐ Recognize the importance of genetic variation and adaptation.

Classification and Taxonomy

- ☐ Classify organisms using a hierarchical classification system.
- ☐ Compare characteristics of the domains and kingdoms.
- ☐ Use dichotomous keys to identify organisms.

Ecology and the Environment

- ☐ Describe interactions among organisms (predation, competition, symbiosis).
- ☐ Explain energy flow through food chains, food webs, and trophic levels.
- ☐ Analyze cycles in nature (carbon, nitrogen, water).
- ☐ Investigate factors affecting ecosystems (biotic and abiotic).
- ☐ Describe the impact of human activities on ecosystems and biodiversity.

Biological Systems

- ☐ Compare body systems (circulatory, respiratory, digestive, etc.) and explain their interactions.
- ☐ Identify feedback mechanisms that maintain homeostasis in organisms.

