

Zoology

Core High School Nature of Science Standards, Supporting Skills, Assessments, and Resources

Indicator 1: Understand the nature and origin of scientific knowledge.

Bloom's Taxonomy Level	Standard	Supporting Skills	Assessment	Resources
(Evaluation)	9-12.N.1.1. Students are able to evaluate a scientific discovery to determine and describe how societal, cultural, and personal beliefs influence scientific investigations and interpretations.	<ul style="list-style-type: none">Recognize scientific knowledge is not merely a set of static facts but a dynamic and affords the best current explanations Examples: telescope, birth control pill, penicillin, electricity Examples: spontaneous generation, relativity, geologic time	Chapter ?'s Dissection Lab Quizzes Chapter Review Chapter test	Biology text (Chapters, 18, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45)

Indicator 2: Apply the skills necessary to conduct scientific investigations.

Bloom's Taxonomy Level	Standard	Supporting Skills	Assessments	Resources
(Synthesis)	9-12.N.2.1. Students are able to apply science process skills to design and conduct student investigations.	<ul style="list-style-type: none"> • Use technology and mathematic skills to enhance investigations, communicate results, and defend conclusions. <p>Example:</p> <ul style="list-style-type: none"> • computer-based data collection • graphical analysis and representation • use appropriate technology to display data <ul style="list-style-type: none"> - spreadsheets - PowerPoint - Web 	Animal Research Project	Animal Research Project
(Application)	9-12.N.2.2. Students are able to practice safe and effective laboratory techniques.	<ul style="list-style-type: none"> • Handle hazardous materials properly. • Use safety equipment correctly. • Practice emergency procedure. • Wear appropriate attire. • Practice safe behaviors. 	Observation of safe lab techniques	All Dissections

**Core High School Nature of Science
Performance Descriptors**

Advanced	High school students performing at the advanced level: <ul style="list-style-type: none">• given a scientific discovery, evaluate how different societal, cultural, and personal beliefs influenced the investigation and its interpretation;• design and conduct an investigation using an alternative student- developed hypothesis.
Proficient	High school students performing at the proficient level: <ul style="list-style-type: none">• given a scientific discovery narrative, determine and describe how societal, cultural, and personal beliefs influenced the investigation and its interpretation;• describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws; then apply science process skills to design and conduct student investigations.
Basic	High school students performing at the basic level: <ul style="list-style-type: none">• describe the role of observation in the development of hypotheses, theories, and laws and conduct student investigations;• given a scientific discovery narrative, identify the cultural and personal beliefs that influenced the investigation.

**Core High School Life Science
Standards, Supporting Skills, Assessments, and Resources**

Indicator 1: Understand the fundamental structures, functions, classifications, and mechanisms found in living things.

Bloom's Taxonomy Level	Standard	Supporting Skills	Assessments	Resources
(Analysis)	<p>9-12.L.1.1. Students are able to relate cellular functions and processes to specialized structures within cells.</p> <ul style="list-style-type: none"> • Transport Examples: cell membrane, homeostasis • Photosynthesis and respiration Examples: ATP-ADP energy cycle Role of enzymes Mitochondria Chloroplasts • Storage and transfer of genetic information Examples: replication, transcription, and translation • Cell life cycles Examples: somatic cells (mitosis), germ cells (meiosis) 	<ul style="list-style-type: none"> • explain how homeostasis is maintained within living systems (PROFICIENT) • describe the relationship between structure and function (cells, tissues, organs, organ systems, and organism) • identify DNA as the structure that carries the genetic code (BASIC) • relate cell membrane structure with its role regulating what enters and leaves cell • compare and contrast the mechanisms of different types of transport in body systems • Compare and contrast the effect on cells placed in a hypertonic, hypotonic, or isotonic solution • describe the relationships between the levels of organization in multi-cellular orga (tissues, organs, organ systems) (PROFICIENT) • predict how homeostasis is maintained within living systems (ADVANCED) 	<p>Chapter ?'s</p> <p>Dissection Lab</p> <p>Quizzes</p> <p>Chapter Review</p> <p>Chapter test</p>	<p>Biology text</p> <p>(Chapters, 18, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45)</p>

<p>(Application)</p>	<p>9-12.L.1.2. Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</p> <p>Note: There is an ongoing scientific debate about the number of groupings and which organisms should be included in each.</p>	<ul style="list-style-type: none"> • Distinguish between vertebrates and invertebrates • Classify organisms using Linnaeus’s hierarchy and binomial nomenclature • Distinguish how classification of plants and animals differ • Apply different classification systems to classify organisms (6 Kingdom system, cladistics, 3 Domain system) <p>classify organisms using a dichotomous key (PROFICIENT)</p>	<p>Chapter ?’s</p> <p>Dissection Lab</p> <p>Quizzes</p> <p>Chapter Review</p> <p>Chapter test</p>	<p>Biology text</p> <p>(Chapters, 18, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45)</p>
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(Analysis)	9-12.L.1.3. Students are able to identify structures and function relationships within major taxa.	Students are able to identify structures and function relationships within animal major taxa for all animal groups covered: (Worms, Mollusks, Echinoderms, Arthropods, Osteichthyes, Amphibians, Reptiles, Birds, and Mammals)	Chapter ?'s Dissection Lab Quizzes Chapter Review Chapter test	Biology text (Chapters, 18, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45)
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**Core High School Life Science
Performance Descriptors**

Advanced	<p>High school students performing at the advanced level:</p> <ul style="list-style-type: none">• explain the steps of photophosphorylation and the Calvin Cycle;• analyze chemical reaction and chemical processes involved in the Calvin Cycle and Krebs Cycle;• predict the function of a given structure;• predict the outcome of changes in the cell cycle;• explain how protein production is regulated;• predict how homeostasis is maintained within living systems;• predict how traits are transmitted from parents to offspring;• construct an original dichotomous key.
Proficient	<p>High school students performing at the proficient level:</p> <ul style="list-style-type: none">• describe and give examples of chemical reactions required to sustain life (hydrolysis, dehydration synthesis, photosynthesis, cellular respiration, ADP/ATP, role of enzymes);• describe the relationship between structure and function (cells, tissues, organs, organ systems, and organisms);• compare and contrast the cell cycles in somatic and germ cells;• tell how DNA determines protein formation;• explain how homeostasis is maintained within living systems;• explain how traits are transmitted from parents to offspring;• predict the impact of genetic changes in populations (mutation, natural selection and artificial selection, adaptation/extinction);• predict how life systems respond to changes in the environment;• classify organisms using a dichotomous key.
Basic	<p>High school students performing at the basic level:</p> <ul style="list-style-type: none">• name chemical reactions required to sustain life (hydrolysis, dehydration synthesis, photosynthesis, cellular respiration, ADP/ATP, role of enzymes);• recognize that different structures perform different functions;• describe the life cycle of somatic cells;• identify DNA as the structure that carries the genetic code;• define homeostasis;• identify that genetic traits can be transmitted from parents to offspring;• know the purpose of a dichotomous key.

**Advanced High School Life Science
Standards, Supporting Skills, and Examples**

Indicator 1: Understand the fundamental structures, functions, classifications, and mechanisms found in living things.

Bloom's Taxonomy Level	Standard	Supporting Skills	Assessments	Resources
(Synthesis)	9-12.L.1.2A. Students are able to describe how living systems use biofeedback mechanisms to maintain homeostasis.	<p>Students are able to describe how living systems use biofeedback mechanisms to maintain homeostasis.</p> <p>Examples: endocrine, nervous, immune</p> <ul style="list-style-type: none"> • predict how homeostasis is maintained within living systems (ADVANCED) 	<p>Chapter ?'s</p> <p>Dissection Lab</p> <p>Quizzes</p> <p>Chapter Review</p> <p>Chapter test</p>	<p>Biology text</p> <p>(Chapters, 18, 34, 36, 37, 38, 40, 41, 42, 43, 44, 45)</p>
(Analysis)	9-12.L.1.5A. Students are able to classify organisms using characteristics and evolutionary relationships of domains.	<p>Students are able to classify organisms using characteristics and evolutionary relationships of domains.</p> <p>Examples: eubacteria, archaebacteria, and eukaryotes (Animals)</p>	<p>Chapter ?'s</p> <p>Dissection Lab</p> <p>Quizzes</p> <p>Chapter Review</p> <p>Chapter test</p>	<p>Biology text</p> <p>(Chapters 18 & 34)</p>