

Idaho Extended Content Standards Draft
 Extended Content Indicators
 Grade 9-10
 Science

Standard 1: Nature of Science - Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.

Extended Standard 1: Students follow the basic tenets of scientific investigation by making accurate observations, applying proper scientific instruments and measurement tools, and communicating results. Students record accurate information by utilizing the tools of a simple investigation. Students participate in creating lab reports using graphs, charts, or diagrams to communicate results.

Topic	GR	Goals	Objectives	Essence	Extended Content Indicators
Interrelated Nature of Science	9-10.S.1.1	Understand Systems, Order, and Organization	9-10.B.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a)		9-10.B.1.1.1.A Demonstrate understanding of a system.
			9-10.B.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)		9-10.B.1.1.2 A Use a model to display order & organization to a given system.

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Topic	Gr	Goal	Objectives	Essence	Extended Content Indicators
Interrelated nature of science	9-10.S.1.2	Understand Concepts and Processes of Evidence, Models, and Explanation	9-10.B.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a)		9-10.B.1.2.1.A Compare and contrast relative data.
			9-10.B.1.2.2 Develop models to explain concepts or systems. (648.02b)		9-10.B.1.2.2.A Use models to explain concepts or systems.
			9-10.B.1.2.3 Develop scientific explanations based on knowledge, logic and analysis. (648.02c)		9-10.B.1.2.3.A Develop a scientific explanation based on known data.

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Topic	Gr	Goal	Objectives	Essence	Extended Content Indicators
Interrelated Nature of Science	9-10.S.1.3	Understand Constancy, Change, and Measurement	9-10.B.1.3.1 Measure changes that can occur in and among systems. (648.03b)		9-10.B.1.3.1.A Measure changes that can occur in and among systems.
			9-10.B.1.3.2 Analyze changes that can occur in and among systems. (648.03b)		9-10.B.1.3.2.A Respond to changes that can occur in and among systems.
			9-10.B.1.3.3 Measure and calculate using the metric system. (648.03c)		9-10.B.1.3.3.A Measure using the metric system or U.S. Customary System of Measurement.

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Topic	Gr	Goal	Objectives	Essence	Extended Content Indicators
	9-10.S.1.4	Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State	Reference to 7.S.3.2.1		Reference to 7.S.3.2.1 A

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Topic	Gr	Goal	Objectives	Essence	Extended Content Indicators
Interrelated Nature of Science	9-10.S.1.5	Understand Concepts of Form and Function	No objectives in Biology.		No objectives in Biology.

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Topic	Gr	Goal	Objective	Essence	Extended Content Indicators
	9-10.S.1.6	Understand Scientific Inquiry and Develop Critical Thinking Skills	9-10.B.1.6.1 Identify questions and concepts that guide scientific investigations. (649.01a)		9-10.B.1.6.1.A Identify questions that can guide scientific investigations.
			9-10.B.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)		9-10.B.1.6.2.A Identify the basic components of an experiment design.
			9-10.B.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c)		9-10.B.1.6.3.A Select and use appropriate technology to make investigations.
			9-10.B.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d)		9-10.B.1.6.4.A Construct explanations and/or models using evidence.
			9-10.B.1.6.5 Analyze alternative explanations and models. (649.01e)		9-10.B.1.6.5.A Select alternative explanations and models.
			9-10.B.1.6.6 Communicate and defend a scientific argument. (649.01f)		9-10.B.1.6.6.A Communicate scientific procedures and explanations.
			9-10.B.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)		9-10.B.1.6.7.A Compare the differences among observations.

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Interrelated Nature of Science	9-10.S.1.7	Understand That Interpersonal Relationships Are Important in Scientific Endeavors	No objectives in Biology.		No objectives in Biology.

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	9-10.S.1.8	Understand Technical Communication	9-10.B.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a)		9-10.B.1.8.1.A Use graphs, charts, and diagrams.

Standard 2: Physical Science - No goals or objectives in Biology.

Standard 3: Biology – Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life.

Extended Standard 3: Students list cell parts and their importance in relationship to the structure of an organism. Students identify functions of cell structures. Identify traits passed from one generation to another. Students differentiate between plant and animals cells and identify characteristic of each. Students communicate how traits are passed on to generations and how traits change in order to adapt to their environment.

Topic	Gr	Goal	Objective	Essence	Extended Content Indicators
Biology	9-10.S.3.1	Understand the Theory of Biological Evolution	9-10.B.3.1.1 Use the theory of evolution to explain how species change over time. (652.01a)		9-10.B.3.1.1.A Show how a species has changed over time.
			9-10.B.3.1.2 Explain how evolution is the consequence of interactions among the potential of a species to increase its numbers, genetic variability, a finite supply of resources, and the selection by the environment of those offspring better able to survive and reproduce. (652.01a)		9-10.B.3.1.2.A Identify what happens to a species: when there is a little supply of resources or with offspring better able to survive and reproduce.

Standard 3: Biology – Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life.

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Biology	9-10.S.3.2	Understand the Relationship between Matter and Energy in Living Systems	9-10.B.3.2.1 Explain how matter tends toward more disorganized states (entropy). (653.01a)		9-10.B.3.2.1.A Show that matter tends to undergo spontaneous changes.
			9-10.B.3.2.2 Explain how organisms use the continuous input of energy and matter to maintain their chemical and physical organization. (653.01b)		9-10.B.3.2.2.A Show that organisms need continuous energy and matter to maintain life.
			9-10.B.3.2.3 Show how the energy for life is primarily derived from the sun through photosynthesis. (653.01c)		9-10.B.3.2.3.A Identify the sun as the primary source of energy for life.
			9-10.B.3.2.4 Describe cellular respiration and the synthesis of macromolecules. (653.01d)		9-10.B.3.2.4.A Identify that respiration involves the release of energy.
			9-10.B.3.2.5 Show how matter cycles and energy flows through the different levels of organization of living systems (cells, organs, organisms, communities) and their environment. (653.01h)		9-10.B.3.2.5 A Show how matter cycles and energy flows through a living system.

Standard 3: Biology – Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life.

Extended Standard 3: Students list cell parts and their importance in relationship to the structure of an organism. Students identify functions of cell structures. Identify traits passed from one generation to another. Students differentiate between plant and animals cells and identify characteristic of each. Students communicate how traits are passed on to generations and how traits change in order to adapt to their environment.

Topic	Gr	Goal	Objective	Essence	Extended Content Indicators
Biology	9-10.S.3.3	Understand the Cell is the Basis of Form and Function for All Living Things	9-10.B.3.3.1 Identify the particular structures that underlie the cellular functions. (651.01a)		9-10.B.3.3.1.A Identify a cell and its particular structures.
			9-10.B.3.3.2 Explain cell functions involving chemical reactions. (651.01b)		9-10.B.3.3.2.A Identify different functions of particular cell structures.
			9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c)		9-10.B.3.3.3.A Identify that cells store information for transferring to the next generation of cells.
			9-10.B.3.3.4 Explain how selective expression of genes can produce specialized cells from a single cell. (651.01e)		9-10.B.3.3.4.A Identify how the role of genes plays in differentiation.

Standard 4: Earth & Space Systems – No goals or objectives in Biology.

Standard 5: Personal and Social Perspectives; Technology – Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

Extended Standard 5: Students explore how science and technology interact and impact both society and the environment. Students identify environmental issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

Topic	Gr	Goal	Objective	Essence	Extended Content Indicators
Environmental Science	9-10.S.5.1	Understand Common Environmental Quality Issues, Both Natural and Human Induced	9-10.B.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, forest health, and agricultural production. (656.01a)		9-10.B.5.1.1.A Identify common environmental issues such as water, air, or trash.

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Extended Standard 5: Students explore how science and technology interact and impact both society and the environment. Students identify environmental issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

Topic	Gr	Goal	Objective	Essence	Extended Content Indicators
Technology	9-10.S.5.2	Understand the Relationship between Science and Technology	9-10.B.5.2.1 Explain how science advances technology. (655.01a)		9-10.B.5.2.1.A Show how science advances technology.
			9-10.B.5.2.2 Explain how technology advances science. (655.01a)		9-10.B.5.2.2.A Show how technology advances science.
			9-10.B.5.2.3 Explain how science and technology are pursued for different purposes. (656.01b)		9-10.B.5.2.3.A Identifies different purposes for science research and technology.

Standard 5: Personal and Social Perspectives; Technology - Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

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Natural Resources	9-10.S.5.3	Understand the Importance of Natural Resources and the Need to Manage and Conserve Them	9-10.B.5.3.1 Describe the difference between renewable and nonrenewable resources. (656.03a)		9-10.B.5.3.1 Identify between renewable and nonrenewable resources.