

Science - Life Science (Grade 7)

Idaho Department of Education Content Standards	Objective	Sub Objectives	Task Analysis	Essential Vocabulary	Sample Assessments	Resources
Cognitive level codes: • B: Memorize • C: Perform procedures • D: Demonstrate understanding • E: Conjecture, generalize, prove • F: Solve non-routine problems, make connections	Bloom's Equivalent • B = Knowledge • C = Comprehension • D = Comprehension • E = Application and Analysis • F = Synthesis					
Standard 1: Nature of Science						
Goal 1.1: Understand Systems, Order, and Organization	7.S.1.1.1 Define small systems as a part of a whole system. (633.01.a) CL: E Content Limit: Items should address content that the student has experience with such as fire drills, the organization of sports teams, an orchestra, or a band. Items can also address topics like organelles in protozoa or the role various plant cell types play in the survival of the plant. The idea is to draw learning together for students.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Define small systems as a part of a whole system (e.g. cell, levels of ecosystem, organ systems). • Identify systems of classification (e.g. taxonomy). • Describe the system of assigning scientific names to organisms (e.g. binomial nomenclature). • Describe similar traits that would place an organism in its proper kingdom. • List the levels of classification • Use a dichotomous key to identify unknown objects.	classification • taxonomy • dichotomous key • domain • kingdom • phylum • class • order • family • genus • species • characteristics • binomial nomenclature • scientific name		Taxonomy presentation http://staffweb.psdschools.org/shunter/zoologyweb/Intro/Intro%20&%20Taxonomy.pdf (see icee.isu.edu)
	7.S.1.1.2 Determine how small systems contribute to the function of the whole. (633.01.a) CL: E Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Determine how small systems contribute to the function of the whole. (i.e. cell, nature cycles)			
	7.S.1.1.3 Identify the different structural levels of an organism (cells, tissues, organs, and organ systems). (633.01.b) CL: E Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Identify the different structural levels of an organism (cells, tissues, organs, and organ systems).			
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations	7.S.1.2.1 Describe how observations and data are evidence on which to base scientific explanations and predictions. (633.02.a) CL: E Content Limit: Items should offer choices that have a direct link between the observation offered for consideration and the correct answer.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Review methods of observation (e.g. senses, tools) • Distinguish between qualitative and quantitative observations. • List examples of qualitative and quantitative observations.	observation • data • prediction • hypothesis • theory • chart • table • graph • interpret • conclusion • analyze • qualitative observation • quantitative observation		Origin of Life PowerPoint (see icee.isu.edu)
	7.S.1.2.2 Use observations to make defensible inferences. (633.02.b) CL: Content Limit: Graphics or examples should be limited to natural history topics or observable reactions in living systems.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Use observations to make defensible inferences.	inference		

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	7.S.1.2.3 Use models to explain or demonstrate a concept. (633.02.c) CL: Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems. Cell models, the component parts of an eye, and the atomic positioning in solids, liquids, and gases are also suitable topics.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Use models to explain or demonstrate a concept			
Goal 1.3: Understand Constancy, Change, and Measurement	7.S.1.3.1 Identify concepts of science that have been stable over time. (633.03.a) CL: E Content Limit: Address concepts including the cell theory, germ theory of disease, molecular theory of matter, and similar topics.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Identify concepts of science that have been stable over time (e.g., nature cycles, energy flows)			
	7.S.1.3.2 Recognize changes that occur within systems. (633.03.b) CL: E Content Limit: Address topics such as the impact of exercise on breathing and heart rate and the impact of light from a window on the direction of plant growth, etc.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Recognize changes that occur within systems (e.g. natural selection, succession)			
	7.S.1.3.3 Make metric measurements using appropriate tools. (633.03.c) CL: C Content Limit: Use linear metric measures, volume measures of milliliter and liter, and mass measure of grams.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Identify measurement equipment. • Name the metric base units for mass, length, volume, temperature • Convert metric units (e.g. 1 m=1000mm) • Use appropriate measurement tool and units for given substance.	triple beam balance • graduated cylinder • beakers • meter stick • thermometer		Metrics PowerPoint http://daphne.meccahosting.com/~a0000e89/metricsystem.htm (see also icee.isu.edu)
Goal 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 objective 7.S.3.1.1 Describe how natural selection explains species change over time.		• Describe concepts of how species change over time. • Identify evidence that support species change over time (e.g. biological, fossil, genetic).	adaptations • natural selection • evolution • species • variation		
Goal 1.5: Understand Concepts of Form and Function	No objectives at this grade level.					
Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	7.S.1.6.1 Identify controls and variables used in scientific investigations. (634.01.b) CL: E Content Limit: Items should stress the students' ability to distinguish between a control and a variable.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Ask questions that can be answered by scientific investigations Review scientific method • Design an experiment demonstrating knowledge of the use of controls and variables.	variables • controlled group • uncontrolled group • dependent • independent		
	7.S.1.6.2 Use appropriate tools and techniques to gather and display data. (634.01c) CL: C Content Limit: Line graphs, bar graphs, pie charts, and tables are all suitable for use and interpretation.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Use appropriate tools and techniques to gather and display data.	pie chart • table • line graph • bar graph • triple beam balance • graduated cylinder • beakers • meter stick • thermometer • microscope		

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	7.S.1.6.3 Evaluate data in order to form conclusions. (634.01.d) CL: E Content Limit: Data offered for consideration should be linear or tied to a focused topic.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Demonstrate patterns of scientific thinking using examples of past scientists (Redi, Darwin, Mendel), to illustrate how critical thinking and evidence are used to accept or reject hypothesis. • Given examples of evidence, accept or reject a hypothesis.	Conclude • analyze • inference • results • interpret • prediction		
	7.S.1.6.4 Use evidence and critical thinking to accept or reject a hypothesis. (634.01.e) CL: E Content Limit: Material offered for consideration should be single-faceted and include topics like the impact of over-watering potted plants or growing plants in light or darkness	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Demonstrate patterns of scientific thinking using examples of past scientists (Redi, Darwin, Mendel)	hypothesis • evidence • theory		
	7.S.1.6.5 Evaluate alternative explanations or predictions. (634.01.f) CL: E Content Limit: Students should be able to identify two explanations and/or predictions that are reasonable for a topic.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Read and evaluate technical instructions.	prediction		
	7.S.1.6.6 Communicate and defend scientific procedures and explanations. (634.01.g) CL: E Content Limit: Items should address pieces of data or evidence that will support or refute an explanation.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Communicate and defend scientific procedures and explanations.			
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors	No objectives at this grade level.					
Goal 1.8: Understand Technical Communication	7.S.1.8.1 Read and evaluate technical instructions. (643.02.a) CL: E Content Limit: Items indicate that students can read and follow the instructions for lab procedures and textbook activities.	• This objective is not a stand alone strand, rather incorporated throughout the entire curriculum.	• Read and evaluate technical instructions.			
Standard 2: Physical Science						
Goal 2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions	No objectives at this grade level.					
Goal 2.2: Understand Concepts of Motion and Forces	No objectives at this grade level.					
Goal 2.3: Understand the Total Energy in the Universe is Constant	No objectives at this grade level.					
Goal 2.4: Understand the Structure of Atoms	No objectives at this grade level.					
Goal 2.5: Understand Chemical Reactions	No objectives at this grade level.					

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Standard 3: Biology						
Goal 3.1: Understand the Theory of Biological Evolution	7.S.3.1.1 Describe how natural selection explains species change over time. (637.01.a) CL: D Content Limit: Items should address environments in flux (new volcanic islands, lakes being impacted by pollution, the margins of a hot spring), and give insights into how life forms would respond to environmental pressure over time.		<ul style="list-style-type: none"> Describe concepts of how species change over time. Explain how adaptations lead to natural selection. Identify evidence that support species change over time (e.g. biological, fossil, genetic) 	adaptations • natural selection • evolution • species • variation		
	Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems	7.S.3.2.1 Describe how energy stored in food is primarily derived from the sun through photosynthesis. (638.01.a) CL: D Content Limit: Items should probe the basic photosynthetic reaction and the role of producers in the food web.	<ul style="list-style-type: none"> Identify what is necessary for photosynthesis to occur. Demonstrate the process of photosynthesis. 	photosynthesis • glucose • chlorophyll • chloroplast		
	7.S.3.2.2 Describe how the availability of resources (matter and energy) limits the distribution and abundance of organisms. (638.01.b) CL: E Content Limit: Use the food web and interaction of trophic levels to probe this content.	<ul style="list-style-type: none"> List several limiting factors List from simplest to most complex the levels of the environment. Label abiotic and biotic factors in a given ecosystem. Compare and contrast limiting factors and carrying capacity in an ecosystem. 	carrying capacity • limiting factor • producer (autotroph) • consumer (heterotroph) • competition • predator • prey • population • organism • ecosystem • community • habitat • biotic factor (living) • abiotic factors (nonliving)			
	7.S.3.2.3 Illustrate how atoms and molecules cycle among the living and nonliving components of the biosphere. (638.01.c) CL: D Content Limit: Assessed in the classroom, not on the ISAT.	<ul style="list-style-type: none"> Create diagrams of water, nitrogen and carbon cycles showing various ways elements travel through the ecosystem. Explain the relationship between evaporation, condensation and precipitation in the water cycle. Describe the relationship between photosynthesis and respiration in the carbon cycle. Explain nitrogen fixation 	cycle • biosphere • atoms • molecules • element • evaporation • precipitation • transpiration • condensation • states of matter • carbon cycle • nitrogen cycle • water cycle • nitrogen fixation			
	7.S.3.2.4 Identify how energy flows through ecosystems in one direction, from photosynthetic organisms to herbivores, carnivore, and decomposers. (638.01.d) CL: D Content Limit: Use the food web as the basis for items.	<ul style="list-style-type: none"> Define: herbivore, carnivore, omnivore, decomposer. Design a simple food chain including producer, primary consumer, secondary consumer, tertiary consumer, and decomposer. Define symbiosis, and identify examples of each relationship. Distinguish between a food chain and a food web. Explain how available energy changes as energy moves up the food chain. 	food chain • food web • energy pyramid • producer • consumer • decomposer • herbivore • carnivore • omnivore • ecosystem • biomass • symbiosis • mutualism • commensalism • parasitism		Food Chains and Webs PowerPoint (See icee.isu.edu)	
Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things	7.S.3.3.1 Explain the relationships among specialized cells, tissues, organs, organ systems, and organisms. (636.01.a) CL: E Content Limit: Items should address the components of an individual system, such as the digestive system.	<ul style="list-style-type: none"> Explain what specialization in cells means. Define and give examples of specialized cells, tissues, organs, organ systems. Distinguish between each level of organization as it relates to the next level. 	specialized cells • tissues • organs • organ systems • organisms • unicellular • multicellular			

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	7.S.3.3.2 Identify the parts of specialized plant and animal cells. (636.01.b) CL: B Content Limit: Include neurons, skeletal muscle, smooth muscle, cardiac muscle, stomata, and root hairs.		<ul style="list-style-type: none"> List structures found only in plant cells. List structures found only in animal cells. Compare and contrast a plant and animal cell. 	nucleus • cell membrane • cell wall • mitochondria • chloroplast • cytoplasm • ribosome • endoplasmic reticulum • Golgi bodies • vacuole • organelle		
	7.S.3.3.3 Identify the functions of cell structures. (636.01.b) CL: D Content Limit: Organelles that are visible with a light microscope, like vacuoles, chloroplasts, and the nucleus are suitable. Organelles that require an electron microscope for observation (endoplasmic reticulum, ribosomes, etc.) should not be addressed.		<ul style="list-style-type: none"> Describe the function of each organelle within a plant and animal cell. Distinguish between osmosis and diffusion. Distinguish between active and passive transport. Design an experiment to demonstrate the process of osmosis. 	osmosis • diffusion • active transport • passive transport		
	7.S.3.3.4 Describe cell functions that involve chemical reactions. (630.01.c) CL: D Content Limit: Include organelles that are visible with a light microscope: nucleus, vacuoles, chloroplasts, and the cell membrane.		<ul style="list-style-type: none"> Define chemical reaction in a cell Identify chemical reactions that occur within a cell Identify what is necessary for cellular respiration to occur. Distinguish between cellular respiration and photosynthesis. 	cellular respiration • photosynthesis • carbohydrates • lipids • protein • nucleic acids • chemical reaction		
	7.S.3.3.5 Describe how dominant and recessive traits are inherited. (636.01.e) CL: D Content Limit: Include traits easily observed: hair color, eye color, and skin color.	<ul style="list-style-type: none"> Describe how genetic traits are inherited Explain how probability and ratios relate to genetic inheritance. 	<ul style="list-style-type: none"> Summarize Gregor Mendel's contribution to genetics Distinguish between dominant and recessive traits. Distinguish between genotypes and phenotypes. Distinguish between heterozygous and homozygous. Describe the stages of the cell cycle (mitosis) Identify the kind of cell produced by meiosis Compare and contrast the end results between mitosis and meiosis. <ul style="list-style-type: none"> Define Probability Describe the purpose of a Punnett square. Create Punnett squares. Express results of Punnett squares in ratios and percentages. 	dominant • recessive • alleles • genotype • phenotype • Punnett square • homozygous • ratio • probability • heredity • heterozygous • chromosome • gene • traits • DNA • mitosis • meiosis • cytokinesis • interphase		Genetics PowerPoint (see icee.isu.edu)
Standard 4: Earth and Space Systems						
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	No objectives at this grade level.					
Goal 4.2: Understand Geo-chemical Cycles and Energy in the Earth System	No objectives at this grade level.					
Standard 5: Personal and Social Perspectives; Technology						
Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced	No objectives at this grade level.					
Goal 5.2: Understand the Relationship between Science and Technology	7.S.5.2.1 Explain how science and technology are interrelated. (640.01.a)	<ul style="list-style-type: none"> This objective is not a stand alone strand, rather incorporated throughout the entire curriculum. 	<ul style="list-style-type: none"> Relate history of the microscopes Describe how the development of the microscope is related to the increased understanding of life. 	science • technology • compound microscope • electron microscope		

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Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them	7.S.5.3.1 Identify alternative sources of energy. (641.03.a) CL: D Content Limit: Content may include solar and wind power and hybrid vehicles.		<ul style="list-style-type: none"> • Define renewable and nonrenewable resources. • Identify renewable resources. • Identify nonrenewable resources • Identify alternative sources of energy • Examine the pros and cons of alternative sources of energy. 	natural resource • renewable resource • nonrenewable resource • alternative resource • fossil fuel • solar energy • wind power • geothermal • biofuel • hydroelectric • nuclear energy		