

Science - Biology

Idaho Department of Education Content Standards	Objective	Sub Objectives	Task Analysis	Essential Vocabulary	Sample Assessment	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	9-10.B.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a) CL: E Content Limit: Students should be able to identify the components of a system and how the components interact to allow the system to function. Suitable systems to test include the structure of an electric motor, the Earth-Moon system, the solar system, the respiratory system, and the cell as a system.		<ul style="list-style-type: none"> Explain the meaning of system, order, and organization. Organize the parts of a specific system and diagram how they interact. (For example, cellular system, circulatory system, ecosystem) 	order • organization • system		Organize the pile of things lab. Survey of body systems. Physiology Activities: www.the-aps.org/education/Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/ Baloney Detection kit: http://www.physics.smu.edu/~pseudo/baloney.html Lesson: A Survey About Science: http://www.pbs.org/wgbh/evolution/educators/lessons/lesson1/act1notes.html Museum of Hoaxes: http://museumofhoaxes.com/ Gullibility test: http://www.museumofhoaxes.com/test.html Photo quiz: http://www.museumofhoaxes.com/tests/hoaxphototest.html Scientific American Frontiers: "Beyond Science?" (aired November 19, 1997) Nova: Secrets of the Psychics (Original broadcast: October 19, 1993) Sponge Bob-Scientific Method: http://sciencespot.net/Media/scimthdexps.pdf http://sciencespot.net/Media/scimethodconvar.pdf http://sciencespot.net/Media/scimethodconvar2.pdf (others are available at: http://sciencespot.net/Pages/classgen.html)
	9-10.B.1.1.2 Apply the concepts of order and organization to a given system. (648.01a) CL: E Content Limit: Students should be able to identify the components of a system and the role each component has in the system's function.		<ul style="list-style-type: none"> Differentiate the roles of a system, its components and their interactions. 	division of labor • order • interdependence • intradependence • organization		Physiology Activities: www.the-aps.org/education/Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations	9-10.B.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a) CL: E Content Limit: When presented observations and data (including different cell types, genetic traits, or environmental changes over time), students will be able to select the most reasonable explanation from a list of possibilities		<ul style="list-style-type: none"> State that explanations are based on observations, evidence and testing. Explain that hypotheses must be testable. Compare and contrast qualitative and quantitative data. Recognize that science changes with additional data. Predict the most reasonable explanation for a set of observations and/or data. 	hypothesis • data • controlled experiment • dependent variable • independent variable • theory • law • scientific method • analyze • conclusion • modeling • inferring • prediction • observation • quantitative • qualitative • control group • empirical data • evidence		Potato candle dsc.discovery.com/videos Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.2.2 Develop models to explain concepts or systems. (648.02b) CL: Content Limit: Assessed in the classroom, not on the ISAT		<ul style="list-style-type: none"> Define model. List and describe models used in a biology textbook. Develop a model to explain a concept determined by the teacher. 	Model • system		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/

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	9-10.B.1.2.3 Develop scientific explanations based on knowledge, logic and analysis. (648.02c) CL: Content Limit: Assessed in the classroom, not on the ISAT		<ul style="list-style-type: none"> State that science is information about the natural world collected in a measurable and repeatable process called the scientific method. State that explanations are based on observations, evidence and testing. Explain that hypotheses must be testable. Using logic and analysis, predict the most reasonable explanation for a set of observations and/or data. 	Logic • analysis • hypothesis • scientific method • observation • conclusion • evidence		dsc.discovery.com/videos/evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
Goal 1.3: Understand Constancy, Change, and Measurement	9-10.B.1.3.1 Measure changes that can occur in and among systems. (648.03b) CL: E Content Limit: Students should be able to explain changes that occur in systems. Topics may include heart rate, breathing rate, dilation of pupils, cells, ecosystems, biogeochemical cycles, and chemical reactions.		<ul style="list-style-type: none"> Test changes over time using the appropriate tool. 	Milli • centi • kilo • meter • liter • gram • Celsius • degree • hecto • length • mass • volume • temperature • deci • deca • nano • micro		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/ Metric Mania Lesson Plans http://sciencespot.net/Pages/classmetric.html
	9-10.B.1.3.2 Analyze changes that can occur in and among systems. (648.03b) CL: E Content Limit: Students should be able to analyze changes that take place in system performance due to external or environmental changes. Topics may include heart rate, breathing rate, and dilation of pupil changes.		<ul style="list-style-type: none"> Apply mathematics in interpreting scientific data. Analyze and extrapolate data from a chart, graph or table. 	extrapolate • interpret • table • chart • graph		dsc.discovery.com/videos/Physiology Activities www.the-aps.org/education/ Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.3.3 Measure and calculate using the metric system. (648.03c) CL: C Content Limit: Students should be able to use metric units to record and analyze data.		<ul style="list-style-type: none"> Identify the units of length, mass, volume and temperature of the metric system. Use the appropriate tool when measuring using the metric system . Convert between units within the metric system using dimensional analysis. 	Milli • centi • kilo • meter • liter • gram • Celsius • degree • hectare • length • mass • volume • temperature		Candy bar lab Metric scavenger hunt. Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
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	7.S.3.2.1 Describe how energy stored in food is primarily derived from the Sun through photosynthesis. (638.01.a)					
Goal 1.5: Understand Concepts of Form and Function	No objectives in Biology.					
Goal 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) CL: E Content Limit: When presented a number of questions, students will be able to identify questions that can be investigated.		<ul style="list-style-type: none"> Formulate questions that address problems that can be investigated scientifically. Explain how observations guide scientific investigations. Differentiate between scientific and non-scientific endeavor. 	scientific method • controlled experiment • dependent variable • independent variable • hypothesis • theory • law • analyze • conclusion • modeling • inferring • prediction • observation		dsc.discovery.com/videos/evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/

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	9-10.B.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b) CL: E Content Limit: Items should address experimental design.		<ul style="list-style-type: none"> • Recall the steps of the scientific method. • Describe the steps of the scientific method. • Construct a situation requiring the use of the scientific method. • List the experimental controls. • List the experimental variables. • Construct and conduct a scientific experiment. • Summarize methods used to communicate scientific data (graphs, charts, tables) • Report results from an experiment using graphs, charts, or tables. • Generate a scientific report that includes test, data, graphs, and charts which relates the results of the experiment. 	scientific method • controlled experiment • dependent variable • independent variable • hypothesis • theory • law • analyze • conclusion • modeling • inferring • prediction • observation • control • graph • table • chart • report		dsc.discovery.com/videos Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c) CL: C Content Limit: Students should be able to identify suitable forms of technology and mathematics needed to solve a problem presented in the question stem.		<ul style="list-style-type: none"> • Utilize available technology in scientific research and reporting. • Apply mathematics in interpreting scientific data. 	technology • research		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d) CL: E Content Limit: Assessed in the classroom, not on the ISAT		<ul style="list-style-type: none"> • Formulate explanations that are based on observations, evidence and testing. • Create hypotheses that are testable. • Using logic and analysis, predict the most reasonable explanation for a set of observations and/or data. 			Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.6.5 Analyze alternative explanations and models. (649.01e) CL: E Content Limit: When offered a variety of possible explanations, students should be able to identify the most logical option to fit with the question stem.		<ul style="list-style-type: none"> • Compare and contrast two or more possible explanations for a set of data. 	compare • contrast • explanation		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
	9-10.B.1.6.6 Communicate and defend a scientific argument. (649.01f) CL: D Content Limit: When offered a variety of possible explanations, students should be able to identify the option that will fit with the question stem.		<ul style="list-style-type: none"> • Debate the pros and cons of a current event that is based on scientific data. 	debate • pros • cons		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/

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	9-10.B.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g) CL: D Content Limit: Students should be able to distinguish between observations, hypotheses, and theories.		• Distinguish between a theory and law, hypothesis and observations, and hypothesis and theory.	theory • law • hypothesis • observation		Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors	No objectives in Biology.					
Goal 1.8: Understand Technical Communication	9-10.B.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a) CL: E Content Limit: Students should be asked to derive information from graphs, charts, and diagrams.		• Interpret and draw conclusions from technical writing, graphs, charts, and diagrams.	technical writing • draw conclusions • axis • data table • legends		* Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/
Standard 2: Physical Science						
Goal 2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions	No goals or objectives in Biology.					
Goal 2.2: Understand Concepts of Motion and Forces	No goals or objectives in Biology.					
Goal 2.3: Understand the Total Energy in the Universe is Constant	No goals or objectives in Biology.					
Goal 2.4: Understand the Structure of Atoms	No goals or objectives in Biology.					
Goal 2.5: Understand Chemical Reactions	No goals or objectives in Biology.					
Standard 3: Biology						
Goal 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) CL: D Content Limit: Items could address isolation of sub-populations within a species.		<ul style="list-style-type: none"> • Define evolution. • Discuss the evidence that convinced Darwin that species could change over time. • Show how natural selection can change a population. • Cite specific examples of natural selection & artificial selection. • Use evidence such as the fossil record, genetic inheritance, patterns and mutation to explain how organisms evolve. • Describe factors that influence speciation. • Relate current organisms to past organisms based on the included evidences. 	fossil record • inheritance patterns • mutation • natural selection • variation • population • evolution • artificial selection • Darwin • speciation		http://free.ed.gov/subjects.cfm?subject_id=41 Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/ Fossil footprint. Design a mouth. Natural Selection simulation. Lab-Aids Natural Selection Experiment Kit (available from Carolina Biological) General Information About Evolution: http://evolution.berkeley.edu/evolibrary/home.php http://evolution.berkeley.edu/evosite/evohome.html http://www.teachersdomain.org/collection/k12/sci.life.evo.processes/

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	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) CL: D Content Limit: Items should address genetic variability in a species, competition for environmental resources within a species, and environmental natural selection.		<ul style="list-style-type: none"> Define the following terms: Genetic Fitness, Genetic Variability, Resources, Selection, Interactions, Habitat, Niche, Limiting Factors, Carrying Capacity. Predict what happens to a population when the following conditions change: Carrying Capacity, Limiting Factors, Genetic Variability and Fitness. 	genetic fitness • genetic variability • resources • selection • interactions • habitat • niche • limiting factors • carrying capacity		Bird Nest lab Project Wild http://free.ed.gov/subjects.cfm?subject_id=41 Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensweb/ Lab-Aids Natural Selection Experiment Kit (available from Carolina Biological) General Information About Evolution: http://evolution.berkeley.edu/evolibrary/home.php http://evolution.berkeley.edu/evo/evohome.html http://www.teachersdomain.org/collection/k12/sci.life.evo.processes/
Goal 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) CL: D Content Limit: Items should probe the concept of entropy.		<ul style="list-style-type: none"> Define and give examples of entropy. 	entropy • matter • energy • decomposition		
	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) CL: E Content Limit: Food webs would be an appropriate way to probe this understanding.		<ul style="list-style-type: none"> List and/or describe the different types of energy. Identify the ultimate source of energy for a given system. Describe the relationship between energy and matter in maintaining life. Diagram a local food web. 	homeostasis • matter • energy • succession • decomposition • potential • kinetic • chemical • solar • thermal		Gold fish lab Food web posters www.nationalgeographic.com/
	9-10.B.3.2.3 Show how the energy for life is primarily derived from the sun through photosynthesis. (653.01c) CL: D Content Limit: The basic photosynthetic reaction should be covered in depth.		<ul style="list-style-type: none"> Define photosynthesis. Describe the chemical equation of photosynthesis. Explain how solar energy is converted into chemical energy. Diagram how carbon dioxide and water are used in photosynthesis. 	photosynthesis • chloroplasts, chlorophyll • carbon dioxide • water • oxygen • glucose		Photosynthesis lab with Vernier Measuring Rate of Photosynthesis in Elodea: http://kenpitts.net/bio/energy/elodea_lab.htm Photosynthesis song Tour of a chloroplast, web animation U-tube Photosynthesis lab http://biology.about.com/gi/dynamic/offsite.htm?site=htp%3A%2F%2Fchem.lapeer.org%2FBio1Docs%2F
	9-10.B.3.2.4 Describe cellular respiration and the synthesis of macromolecules. (653.01d) CL: D Content Limit: Students should understand and be responsible for the basic reaction, the exchange/production of oxygen and carbon dioxide for respiration, and the steps involved in production of macromolecules by living cells.		<ul style="list-style-type: none"> Define cellular respiration. Describe the chemical equation of cellular respiration. Explain how organisms use chemical energy. Classify the different types of macromolecules. Diagram how oxygen and glucose are used in cellular respiration. 	cellular respiration • mitochondria • carbon dioxide • water • oxygen • glucose • ATP • macromolecules • lipids • carbohydrates • nucleic acids • proteins		Cellular Respiration lab with Vernier MI Blue lab Molecules of life lab Lactic acid lab Tennis ball lactic acid lab U-tube Measuring Yeast Fermentation Using Balloons: http://www.prairiepride.org/teachertools/staffpdf/sBender_Yeast%20Lab%20.pdf

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	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) CL: D Content Limit: Energy flow through food webs can be used to assess this objective.		<ul style="list-style-type: none"> • Trace matter through a biogeochemical cycle. • Examine the flow of energy through a living system (For example, a food web or organism). 	biogeochemical cycles • autotrophs • heterotrophs • food webs • energy pyramids • matter • trophic levels		Add cycles to food web posters. Organism flip chart (autotroph or heterotroph) http://free.ed.gov/subjects.cfm?subject_id=41 http://www.teachersdomain.org/collection/k12/sci.life.eco.cycles/
Goal 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) CL: D Content Limit: Items should probe the function of organelles including chloroplasts, the nucleus, and vacuoles.		<ul style="list-style-type: none"> • Identify the organelles and cellular structures. • Describe the functions of each of the organelles of a cell. 	organelle • mitochondria • Golgi apparatus • ribosomes • chloroplasts • nucleus • cell wall • plasma membrane • vacuole • lysosomes • endoplasmic reticulum • cytoskeleton • cilia • flagella • cytoplasm • nucleolus • DNA		www.cellsalive.com Cell catalog Inside a cell video http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ Lab: Observing plant and animal cells under the microscope Make a "Catalog" of cell parts: http://t4.jordan.k12.ut.us/teacher_resources/Science/mo delclassroomroot/Activities/ Biology%20Activities/Standard%202/Objective%203/Wholecellcatalog.doc http://www.teachersdomain.org/collection/k12/sci.life.stru.cellstruct/ Surface area to volume lab http://chem.lapeer.org/Bio1Docs/CellSize.html
	9-10.B.3.3.2 Explain cell functions involving chemical reactions. (651.01b) CL: D Content Limit: Items should probe the function of organelles including chloroplasts, the nucleus, and vacuoles.		<ul style="list-style-type: none"> • Explain the various functions and interactions of cell organelles. • Describe the role of ATP in the cell. • Explain the role of enzymes in the cell. • Describe the movement of materials through a cell membrane. • Distinguish between the various forms of active transport. 	organelle • mitochondria • Golgi apparatus • ribosomes • chloroplasts • nucleus • cell wall • plasma membrane • vacuole • lysosomes • endoplasmic reticulum • cytoskeleton • cilia • flagella • cytoplasm • nucleolus • DNA • ATP • enzyme • active transport • passive transport		Cell models Egg lab Dialysis tubing/osmosis lab 3-D cell models "Stained glass" cells ? Magraw/Hill website http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ Using Eggs to Study Osmosis: http://sciencespot.net/Pages/classbio.html#Anchor-eggs Enzyme Labs: https://htscience.wikispaces.com/file/view/Catalase+Lab.doc http://www.biologycorner.com/bio3/life_biochem/enzymelab.html PowerPoint: "Enzymes- models of action" http://www.worldofteaching.com/biologypowerpoints.html Diffusion and osmosis http://biology.about.com/gi/dynamic/offsite.htm?site=http%3A%2F%2Fbiology.arizona.edu%2Fscicomm%2Flessons%2Fmccandless%2Fdefault.html

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	9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c) CL: D Content Limit: Items should address DNA replication and mitosis as the mechanism for transferring DNA to the next generation of cells.	<ul style="list-style-type: none"> Explain the process of DNA replication. 	<ul style="list-style-type: none"> Recognize complementary base pairs. Recognize that the specific pairing is due to a chemical structuring of the nitrogen bases. Describe the DNA backbone being composed of alternating phosphate, sugar molecules, and nitrogen bases. Diagram the process of DNA replication. 	DNA • nucleotide • double helix • base pair • adenine • guanine • thymine • cytosine • deoxyribose • nucleic acid • phosphate • replication		Build a DNA model with kit. http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ DNA Replication Video on YouTube: http://www.youtube.com/watch?v=hfZ8o9D1tus
	9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c) (CONTINUED) CL: D Content Limit: Items should address DNA replication and mitosis as the mechanism for transferring DNA to the next generation of cells.	<ul style="list-style-type: none"> Explain the process of protein synthesis. 	<ul style="list-style-type: none"> Compare and contrast the structure and role of DNA and RNA within a cell. Diagram the process of protein synthesis. 	RNA • mRNA • tRNA • amino acids • transcription • translation • ribosome • codon • anticodon • enzyme		Show the protein synthesis with DNA/RNA kit. Model the gene to protein process. Enzyme lab Liver lab Pineapple and jello lab http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ Protein synthesis Video on YouTube: http://www.youtube.com/watch?v=NJxobgkPEAo Protein identification lab http://biology.about.com/gi/dynamic/offsite.htm?site=http%3A%2F%2Fchem.lapeer.org%2Fbio1Docs%2F
	9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c) (CONTINUED) CL: D Content Limit: Items should address DNA replication and mitosis as the mechanism for transferring DNA to the next generation of cells.	<ul style="list-style-type: none"> Describe the process of mitosis and its role in the cell cycle. 	<ul style="list-style-type: none"> Diagram and label the steps of mitosis. Explain the role of mitosis in the cell cycle. 	cell cycle • interphase • prophase • metaphase • anaphase • telophase • cytokinesis • chromosome.		www.cellsalive.com Mitosis flip book: http://sciencespot.net/Pages/classbio.html#Anchor-mitosis www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/
	9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c) (CONTINUED) CL: D Content Limit: Items should address DNA replication and mitosis as the mechanism for transferring DNA to the next generation of cells.	<ul style="list-style-type: none"> Describe the process of meiosis and its role in inheritance. 	<ul style="list-style-type: none"> Diagram and label the steps of meiosis. Compare and contrast mitosis and meiosis. 	diploid • haploid • gametes • crossing over • allele • segregation		www.cellsalive.com http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ PowerPoint: "Meiosis" http://www.worldofteaching.com/biologypowerpoints.html Meiosis Internet Lesson: http://wiki.theplaz.com/w/images/Meiosis_Web_Worksheet.pdf

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	9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c) (CONTINUED) CL: D Content Limit: Items should address DNA replication and mitosis as the mechanism for transferring DNA to the next generation of cells.	• Describe the process of inheritance.	<ul style="list-style-type: none"> Summarize how the process of meiosis produces genetic variability. Explain the difference between dominant and recessive alleles. Compute the genotypic and phenotypic ratios from Punnett square crosses. Analyze and synthesize a pedigree chart. 	dominant • recessive • genotype • phenotype • allele • homozygous • heterozygous • Punnett square • pedigree • genetic recombination • sex linked trait		<p>www.teachersdomain.org/collection/k12/sci.life.gen Physiology Activities www.the-aps.org/education/ Various Genetics Activities http://learn.genetics.utah.edu/ Pedigree Worksheets</p> <p>http://teachers.henrico.k12.va.us/DeepRun/ramsey_s/RESOURCES_ALL/BIOLOGY/genetics/pedigree_ws.doc http://drytll.org/ap%20bio/Mendellian%20Genetics/Pedigrees.doc Pass the Genes Game: http://nature.ca/genome/04/041/0414_e.cfm Oompa Loompa genetics:</p> <p>http://www.biologycorner.com/worksheets/Genetics_Oompa_Loompa.pdf Paper Pets: http://www.biologycorner.com/worksheets/paperpets.pdf</p>
	9-10.B.3.3.4 Explain how selective expression of genes can produce specialized cells from a single cell. (651.01e) CL: D Content Limit: Items should address the role genes play in differentiation.		<ul style="list-style-type: none"> Describe the process of gene expression. Explain the role of mutation in gene function. Explain the role of cell specialization in multicellular organisms. 	gene • trait • mutation • genetic disease • differentiation • specialization		<p>http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen Various Genetics Activities http://learn.genetics.utah.edu/ The Mighty Mutation Maker Game: http://nature.ca/genome/04/0413_e.cfm Sloozee Worm Mutagenesis:</p> <p>http://learn.genetics.utah.edu/archive/sloozeworm/scenario.html Oompa Loompa genetics:</p> <p>http://www.biologycorner.com/worksheets/Genetics_Oompa_Loompa.pdf Paper Pets: http://www.biologycorner.com/worksheets/paperpets.pdf http://www.teachersdomain.org/collection/k12/sci.life.st.ru.differentiation/</p>
Standard 4: Earth and Space Systems						
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	No goals or objectives in Biology.					
Goal 4.2: Understand Geochemical Cycles and Energy in the Earth System	No goals or objectives in Biology.					
Standard 5: Personal and Social Perspectives; Technology						

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Goal 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) CL: E Content Limit: Issues relevant to Idaho should be addressed: stream degradation, logging, mining, dams, and wind turbines.		<ul style="list-style-type: none"> Critique the impact of humans on the environment. (For example, stream degradation, logging, mining, dams, and wind turbines) 	conservation • preservation • sustainable development • hazardous waste • air quality • water quality • agriculture • pollution • deforestation • fertilizer • pesticides • herbicides • energy sources • population density		ecological footprint quiz www.myfootprint.org http://free.ed.gov/subjects.cfm?subject_id=41 http://www.teachersdomain.org/collection/k12/sci.life.eco.human/
Goal 5.2: Understand the Relationship between Science and Technology	9-10.B.5.2.1 Explain how science advances technology. (655.01a) CL: E Content Limit: Use scientists whose discoveries have significance and ramifications in today's world to frame items.		<ul style="list-style-type: none"> List examples of how science advances technology. Inspect how discoveries have impacted technology. (For example, Watson and Crick, Louis Pasteur, Alexander Fleming) 	technology • science		http://free.ed.gov/subjects.cfm?subject_id=41
	9-10.B.5.2.2 Explain how technology advances science. (655.01a) CL: E Content Limit: Use common pieces of technology (lenses, electricity, computers, etc.) as the foundation for items that lead students to see the role technology has in advancing science.		<ul style="list-style-type: none"> Access how technology advances science. (microscope, computer, etc.) 	technology • science		http://free.ed.gov/subjects.cfm?subject_id=41
	9-10.B.5.2.3 Explain how science and technology are pursued for different purposes. (656.01b) CL: E Content Limit: Items should address the role of technology in applying science to improve some aspect of human life, and the role of science in answering questions and extending knowledge.		<ul style="list-style-type: none"> Model how technology and science can be used to solve problems. Explain the different roles of technology and science. 	technology • science		http://free.ed.gov/subjects.cfm?subject_id=41
Goal 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) CL: D Content Limit: Topics like oil, metallic ores, and wood products are suitable for consideration		<ul style="list-style-type: none"> Compare and contrast renewable and nonrenewable resources. Debate the impact of using renewable and nonrenewable resources. 	renewable • nonrenewable • recycling • resource		ecological footprint quiz www.myfootprint.org

Science - Biology

Idaho Department of Education Content Standards	Objective	Sub Objectives	Task Analysis	Essential Vocabulary	Sample Assessment	Resources
Misc. websites: dsc.discovery.com/videos http://free.ed.gov/subjects.cfm?subject_id=41 www.teachersdomain.org/collection/k12/sci.life.gen www.nationalgeographic.com/ Physiology Activities www.the-aps.org/education/ Neuroscience for Kids http://faculty.washington.edu/chudler/chgames.html Hands-on activities for HS and Middle school Biology http://serendip.brynmawr.edu/sci_edu/waldron/ Evolution and Nature of Science teaching activities http://www.indiana.edu/~ensiweb/ Case studies for various biology topics http://ublib.buffalo.edu/libraries/projects/cases/ubcase.htm Various Genetics Activities http://learn.genetics.utah.edu/ Misc. biology animations, movies and tutorials http://nhscience.lonestar.edu/biol/biolint.htm Misc. http://sciencespot.net/ Misc. http://www.npr.org/ Misc. lesson plans http://www.accessexcellence.org/AE/		http://discoveryeducation.com/ Misc. http://www.nsta.org/ DNA lessons, animations, resources http://www.dnai.org/ Lessons: Nature of Science, Evolution, Origin of Life, Genetics-DNA http://www.indiana.edu/~ensiweb/ Genetics educational resources http://www.ornl.gov/sci/techresources/Human_Genome/education/education.shtml Educational community for teachers http://www.teachertube.com/				