

Teacher: Core General Science

Year: 2008-2009

Course: General Science

A U G U S T	The Nature of Science		
	Content	Skills	Standards
	Science skills and methods Laboratory technique and lab safety Accurate measurement Reporting and presenting data	Identify and use science skills and methods Describe and design a controlled experiment Use proper and safe laboratory techniques Compare volume, mass, and density Measure mass, length, volume, and temperature Interpret information from graphs Use graphs to report data from experiments	9-12.NS.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. 9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws. 9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations. 9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
S E P T E M B	Motion and Speed		
	Content	Skills	Standards
	Science skills and methods Lab Techniques and Lab Safety	Identify and use science skills and methods Describe and designed a	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to

E R	Accurate measurement	controlled experiment	design and conduct student investigations.
	Report and Present data	Use proper and safe laboratory techniques	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
	Object acceleration	Explain the difference between speed and velocity	9-12.P.2.0 ~ Analyze forces, their forms, and their effects on motions.
	Motion graphs	Describe what Inertia is and how it is related to Newton's 1st Law of Motion	9-12.P.2.1 ~ Students are able to apply concepts of distance and time to the quantitative relationships of motion using appropriate mathematical formulas, equations, and units.
	Interpret motion graphs	9-12.P.2.2 ~ Students are able to predict motion of an object using Newton's Laws.	9-12.P.2.3 ~ Students are able to relate concepts of force, distance, and time to the quantitative relationships of work, energy, and power.

O C T O B E R	Energy		
	Content	Skills	Standards
	Kinetic and potential energy	Math skills- calculate the kinetic energy of an object	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.
	Ways energy can be stored	Calculate gravitational potential energy	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.
Law of Conservation of Energy	Explain how energy transformation occurs	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques. 9-12.P.2.0 ~ Analyze forces, their forms, and their effects on motions. 9-12.P.2.2 ~ Students are able to predict motion of an object using Newton's Laws.	

		<p>9-12.P.2.3 ~ Students are able to relate concepts of force, distance, and time to the quantitative relationships of work, energy, and power.</p> <p>9-12.P.3.0 ~ Analyze interactions of energy and matter.</p> <p>9-12.P.3.1 ~ Students are able to describe the relationships among potential energy, kinetic energy, and work as applied to the Law of Conservation of Energy.</p>
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Forces

Content	Skills	Standards
<p>Science skills and methods</p> <p>Movement / non movement of objects</p> <p>Three kinds of friction</p> <p>Effects of air resistance on falling objects</p>	<p>Math skills for calculation of acceleration</p> <p>Compare the effects of the 3 forms of friction</p> <p>Calculate weight based on gravity and mass</p> <p>Describe how force, mass, and acceleration are related</p> <p>Calculate acceleration of objects based on force and mass</p> <p>Describe the influence of air resistance</p>	<p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.P.2.1 ~ Students are able to apply concepts of distance and time to the quantitative relationships of motion using appropriate mathematical formulas, equations, and units.</p> <p>9-12.P.2.2 ~ Students are able to predict motion of an object using Newton's Laws.</p> <p>9-12.P.2.3 ~ Students are able to relate concepts of force, distance, and time to the quantitative relationships of work, energy, and power.</p> <p>9-12.P.1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p>

Motion and Speed

Content	Skills	Standards
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<p>Positive and negative acceleration effects motion.</p> <p>Relation of force, net force, balanced force, and inertia</p>	<p>Calculate the acceleration of an object. $A = \text{change in velocity} / \text{time}$</p> <p>Identify and demonstrate knowledge of force in its various forms</p>	<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P.2.3 ~ Students are able to relate concepts of force, distance, and time to the quantitative relationships of work, energy, and power.</p>
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NOVEMBER **Work and Machines**

Content	Skills	Standards
<p>Meaning of work</p> <p>Relation of work and energy</p> <p>Work and power</p>	<p>Calculate work</p> <p>Calculate power and it's relationship to work</p> <p>Calculate mechanical advantage of machines</p> <p>Calculate efficiency of machines</p> <p>Calculate ideal mechanical advantage for various simple machines</p>	<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P.3.1 ~ Students are able to describe the relationships among potential energy, kinetic energy, and work as applied to the Law of Conservation of Energy.</p>

DECEMBER **Electricity**

Content	Skills	Standards
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M B E R	Difference between electric current and static electricity	Demonstrate science skills and methods	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.
	Relationship between voltage difference, resistance, and current	Demonstrate lab techniques and lab safety	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.
	Function of fuses and circuit breakers	Compare parallel and series circuits	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
	Electrical Power	Calculate electrical power	9-12.P.3.0 ~ Analyze interactions of energy and matter. 9-12.P.3.1 ~ Students are able to describe the relationships among potential energy, kinetic energy, and work as applied to the Law of Conservation of Energy. 9-12.P.3.3 ~ Students are able to describe electrical effects in terms of motion and concentrations of charged particles.

Thermal Energy

Content	Skills	Standards
Convection, conduction, and radiation	Use of science methods and skills	9-12.P.3.0 ~ Analyze interactions of energy and matter.
Meaning of specific heat	Calculate specific heat and change in thermal energy	9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.
Thermal to mechanical energy	Use proper and safe lab techniques	
Conductors and insulators	Measure temperature change in gases by conduction	
Passive versus active heating systems		

J A N U A R Y	Kinetic Theory of Matter-Solid, Liquids, and Gases		
	Content	Skills	Standards
	Relationship between particle movement and the states of matter	Math Skills	
	Archimedes Principle	Demonstrate accurate observations and accurate measurements	
	Pascal's Principle	Investigate relationship between density and buoyancy	
	Bernoulli's Principle		
	Magnetism and It's Uses		
	Content	Skills	Standards
	Components of a magnet	Demonstrate safe laboratory techniques	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.
	Utilization of electric current to make a useful magnet	Identify and manipulate variables	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.
Electric generator and alternating current	Observe and document data	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.	
Purpose of transformers		9-12.P.2.0 ~ Analyze forces, their forms, and their effects on motions.	
		9-12.P.3.0 ~ Analyze interactions of energy and matter.	
		9-12.P.3.3 ~ Students are able to describe electrical effects in terms of motion and concentrations of charged particles.	
F	Classification of Matter		

F E B R U A R Y	Content	Skills	Standards
	Mixtures and substances	Make accurate observations during experiments	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.
	Elements and compounds	Math skills: balance chemical equations	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.
	Solutions, colloids, and suspensions	Investigate various chemical reactions	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
	Unique physical and chemical properties of substances	Use safe lab techniques	9-12.P.3.0 ~ Analyze interactions of energy and matter.
	Law of Conservation of Mass	Define mixtures and substances	9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter
		Identify elements and compounds	9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).
		Compare and contrast solutions, colloids and suspensions	9-12.P 1.2 ~ Students are able to describe ways that atoms combine.
		Identify substances by their unique physical and chemical properties	9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.
		Describe how the Law of Conservation of Mass applies to chemical reactions	

Properties of Atoms and The Periodic Table of Elem

Content	Skills	Standards
Names and symbols of the naturally occurring elements.	Concept mapping of the parts of the atom	
Atomic mass and the composition of atoms of elements	Solve one step chemical equations	
	Compare and contrast atomic	

Periodic Table of Elements	numbers and atomic mass Problem solving Determine mass by using charts Determine electro negativity of elements using charts Explain the composition of the Periodic Table of Elements	
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M A R C H	Chemical Bonds		
	Content	Skills	Standards
Compounds are different from the elements that compose them Chemical formulas Ions and ionic bonding Covalent bonding Oxidation number of elements	Problem solving - name binary ionic compounds Solve 1 step chemical equations and balancing equations Write and name chemical formulas Explain how compounds are different from the elements that compose them. Determine the oxidation number of elements and define the significance of this	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations. 9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques. 9-12.P.3.0 ~ Analyze interactions of energy and matter. 9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids). 9-12.P 1.2 ~ Students are able to describe ways that atoms combine. 9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.	

9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.

Elements and Properties

Content	Skills	Standards
Properties of metals	Differentiate between metals and non-metals	
Alkali and Earth Metals	Correlate bonding with oxidation numbers	
Hydrogen - a non metal	Interpret data from labs and charts	
Halogens	Use math skills in problem solving	
Non-metals and metalloids	Describe the properties of metals	
Nature of allotropes	List alkali and earth metals	
Carbon and multiple structures of organic compounds	Recognize hydrogen as a non-metal	

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Organic Compounds

Content	Skills	Standards
Structure of organic compounds	Interpret illustrations of organic compounds	9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.
Carbon compounds obtained from petroleum	Distinguish between proteins, carbohydrates, and lipids while	9-12.NS.1.0 ~ Understand the nature and origin of scientific

Structure of proteins, carbohydrates, lipids, and nucleic acids	determining their basic functions	<p>knowledge.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter</p> <p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p> <p>9-12.P 1.2 ~ Students are able to describe ways that atoms combine.</p> <p>9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.</p> <p>9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.</p>
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M A Y	Solutions	
	Content	Standards
	Skills	Standards
Solute and solutions	Calculate surface area and the relationship to the rate of	9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.

Liquids in gases	dissolving	<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p> <p>9-12.P 1.2 ~ Students are able to describe ways that atoms combine.</p>
Solids in liquids	Accurate measurement	
Solids in solids	Safe lab technique	
Precise concentrations		
Saturated and unsaturated solutions		
Ionic solution formation		

Teacher: Core Biology1

Year: 2007-2008

Course: Biology 1

Introduction to Biology		
Content	Skills	Standards
The Characteristics of Living Things	List five characteristics of living things.	9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.
Jobs in Biology	List 15 careers that use biological knowledge.	9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.
The Scientific Method	List 7 steps in the scientific	9-12.NS.1.1 ~ Students are able to evaluate a scientific discovery to
Lab Familiarization and Safety		

<p>Training</p>	<p>method.</p> <p>Locate and use lab safety devices including fire extinguishers, first aid kits, and wash stations.</p> <p>Define the importance of safe lab practices to a school environment.</p>	<p>determine and describe how societal, cultural, and personal beliefs influence scientific investigations and interpretations.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p>
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Water Quality Unit

Content	Skills	Standards
<p>Water as a resource. Our communities impact on our environment. Point source and</p>	<p>Demonstrate the ability to find chemical pollutants in water.</p>	<p>9-12.E.1.0 ~ Analyze the various structures and processes of the Earth system.</p>

<p>nonpoint source pollution. Chemical methods for discovering water pollution. Macro invertebrate surveying for water quality. Laws protecting and preserving our resources. Laws distributing our resources.</p>	<p>Conduct effective tests for dissolved oxygen, chlorine, nitrogen, potassium, pH, and temperature.</p> <p>Conduct chemical field tests for water pollution.</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.</p>
	<p>Name and discuss the importance of the Clean Water Act of 1972 and how it changed the nations approach to water resource conservation.</p> <p>Identify macro invertebrates and utilize them as a method of determining the health of aquatic communities and water quality.</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p>
	<p>Assess and defend key viewpoints on the legal basis for water distribution in Western Communities.</p> <p>Write a meaningful definition of "Clean Water" and write a paragraph that identifies what methods our community utilizes to secure clean water.</p>	<p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p>
		<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p>

		<p>9-12.P.1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p> <p>9-12.S.2.1 ~ Students are able to describe immediate and long term consequences of potential solutions for technological issues.</p> <p>9-12.S.2.3 ~ Students are able to analyze and describe the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.</p>
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Biochemistry

Content	Skills	Standards
<p>Atoms and their interactions</p> <p>Water and Diffusion</p> <p>Life Substances - the carbohydrates, lipids, proteins, and nucleic acids</p>	<p>Read and interpret the periodic table</p> <p>Demonstrate and discuss the characteristics of water.</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p>

		<p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter</p> <p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p> <p>9-12.P 1.2 ~ Students are able to describe ways that atoms combine.</p> <p>9-12.P 1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p> <p>9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.</p> <p>9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.</p>
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Cellular View of Life

Content	Skills	Standards
<p>The first cell scientists and discovery of eukaryotic and prokaryotic cells.</p> <p>The invention and evolution of microscopy for cell study.</p> <p>The structure of the plasma membrane.</p>	<p>Use a microscope to identify and study cells.</p> <p>Draw and label a section of a plasma membrane.</p> <p>Describe the role of plasma membrane structure and to relate how the structure influences</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p>

<p>Introduction to cell organelles, cell cytoplasm and cell nucleus.</p> <p>Methods of Passive and Active Cell Transport</p> <p>Mitosis and the Cell Cycle</p> <p>The roles of ATP in the Energy of Life.</p> <p>Photosynthesis and Metabolism as methods of making ATP.</p>	<p>cellular life.</p> <p>Identify and discuss the functions of each cell structure.</p> <p>Identify each stage of mitosis.</p> <p>Draw and label a diagram of the cell cycle.</p> <p>Discuss the importance of cellular control of the cell cycle.</p> <p>Identify and discuss the roles of Photosynthesis and Metabolism.</p> <p>Name and describe the stages of Photosynthesis.</p> <p>Name and describe the stages of Metabolism.</p>	<p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p>
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Genetics

Content	Skills	Standards
<p>Gregor Mendels discovery of inheritance.</p> <p>Mendels laws of inheritance.</p> <p>Test Crosses.</p> <p>Meiosis and the role of genes and chromosomes in sexual reproduction.</p>	<p>Demonstrate the ability to perform monohybrid and dihybrid crosses.</p> <p>Describe the role of Mendel in the history of genetics.</p> <p>Diagram and describe the stages of meiosis</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.2.1 ~ Students are able to predict inheritance patterns using a single allele.</p>

Origins of genetic variation and recombination.		<p>9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p>
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DNA and Genes as Heritary Units

Content	Skills	Standards
<p>Structure and replication of DNA</p> <p>Translation and Transcription - From DNA to Proteins</p> <p>Mutations: point, frame shift and chromosomal.</p> <p>DNA crosschecks and repair mechanisms.</p>	<p>Draw and label the parts of DNA and describe how heredity results from this structure.</p> <p>Demonstrate how DNA is translated and transcribed into proteins using a model</p> <p>Demonstrate point and frame shift mutations using DNA molecular models</p> <p>Describe how mutations occur in DNA.</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of</p>

scientific discoveries on historical events and social, economic, and ethical issues.

9-12.S.2.1 ~ Students are able to describe immediate and long term consequences of potential solutions for technological issues.

Patterns of Heredity and Human Genetics

Content	Skills	Standards
Constructing pedigrees Dominant traits and Recessive Traits Tracking Genetic Diseases Nonmendelian genetics: incomplete dominance, co dominance, and multiple phenotypes from multiple alleles. Sex determination and sex-linked traits. Sex linked diseases.	Read and follow a pedigree for both recessive and dominant traits. Name and describe two genetically determined diseases. Describe in a written paragraph how the sex of an individual is determined.	

Technological Impacts on Genetics

Content	Skills	Standards
Selective breeding, hybridization and genotype determination.	Describe how mankind has historically manipulated genetics for domestic animals and plants.	9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.
Genetic Engineering and		9-12.L.1.1 ~ Students are able to relate cellular functions and

<p>transgenic organisms. Recombinant DNA technology. Mapping the Human Genome</p>	<p>List and describe two methods commonly utilized by genetic engineers.</p>	<p>processes to specialized structures within cells.</p> <p>9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p> <p>9-12.S.2.1 ~ Students are able to describe immediate and longterm consequences of potential solutions for technological issues.</p>
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Principals of Ecology

Content	Skills	Standards
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<p>Individuals, Populations, Communities, Ecosystems and their relationships.</p> <p>Symbiotic relationships.</p> <p>Food Chains and Nutrient Cycles</p>	<p>Identify and name abiotic and biotic factors in an environment.</p> <p>Separate a list of symbiotic organisms into parasites, commensals, and mutualists.</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p>
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Communities and Biomes

Content	Skills	Standards
<p>Communities and stages of seral succession.</p> <p>Marine and Terrestrial Biomes</p>	<p>Identify seral communities for the Black Hills and surrounding prairies.</p> <p>Write a paragraph describing the historical role of fire as an agent of change within the climax communities of our area.</p>	<p>9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p> <p>9-12.NS.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.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science,</p>

technology, environment, and society.

9-12.S.2.3 ~ Students are able to analyze and describe the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.

Population Biology

Content

Growth of Populations
Carrying capacity, and the roles of density dependent, and density independent factors

Skills

Given an initial population of bacteria, calculate the population at the end of 24 hours.

Predict the effects of population growth on environmental carrying capacity.

Given a problem with unchecked population growth, accurately predict the outcome in terms of resource utilization.

Standards

9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.

9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.

9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.

9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.

9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.

9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.

9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.

9-12.S.2.1 ~ Students are able to describe immediate and longterm consequences of potential solutions for technological issues.

9-12.S.2.3 ~ Students are able to analyze and describe the benefits,

limitations, cost, and consequences involved in using, conserving, or recycling resources.

Biological Conservation and Diversity

Content	Skills	Standards
<p>Threats to Biodiversity: pollution, habitat loss, habitat fragmentation and other impacts of man on his environment.</p> <p>Impacts of exotic species.</p>	<p>Define the term Biodiversity</p> <p>Explain the importance of Biodiversity</p> <p>List four threats to Biodiversity</p>	<p>9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.3 ~ Students are able to analyze and describe the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.</p>

The History of Life

Content	Skills	Standards
The geologic record and the geologic time scale.	Describe the early history of the earth	9-12.E.1.0 ~ Analyze the various structures and processes of the Earth system.
The role of fossils in understanding life's history.	Name the three main geologic epochs	9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.
The changing nature of our understanding of life's origins.		<p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p>

		<p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p>
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The Theory of Evolution

Content	Skills	Standards
<p>History of Scientific Discovery</p> <p>Theory of Evolution</p> <p>Natural selection</p> <p>Predation and adaptation</p> <p>Evidences for the Theory of Evolution.</p> <p>Mechanisms of Evolution</p> <p>Population genetics and evolution</p> <p>Species evolution</p> <p>Natural selection.</p>	<p>Describe in a written paragraph the Theory of Evolution and identify natural selection as the operative mechanism for the theory.</p> <p>List, in writing, four different evidences for the theory of evolution.</p>	<p>9-12.E.1.0 ~ Analyze the various structures and processes of the Earth system.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.2 ~ Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</p> <p>9-12.L.1.3 ~ Students are able to identify structures and function relationships within major taxa.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.2.1 ~ Students are able to predict inheritance patterns using a single allele.</p> <p>9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p>

		<p>9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p>
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Biology Review and Wrap Up

Content	Skills	Standards
Content covered in course to date.	Reinforcement and Review of previously listed skills.	<p>9-12.E.1.0 ~ Analyze the various structures and processes of the Earth system.</p> <p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p>

9-12.E.1.2 ~ Students are able to describe how atmospheric chemistry may affect global climate.

9-12.E.1.3 ~ Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.

9-12.E.2.0 ~ Analyze essential principles and ideas about the composition and structure of the universe.

9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.

9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.

9-12.L.1.2 ~ Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.

9-12.L.1.3 ~ Students are able to identify structures and function relationships within major taxa.

9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.

9-12.L.2.1 ~ Students are able to predict inheritance patterns using a single allele.

9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.

9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.

9-12.L.3.1 ~ Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.

9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.

9-12.NS.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.

9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.

9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.

9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.

9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.

9-12.P.3.0 ~ Analyze interactions of energy and matter.

9-12.P.3.1 ~ Students are able to describe the relationships among potential energy, kinetic energy, and work as applied to the Law of Conservation of Energy.

9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter

9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).

9-12.P 1.2 ~ Students are able to describe ways that atoms combine.

9-12.P 1.3 ~ Students are able to predict whether reactions will speed

		<p>up or slow down as conditions change.</p> <p>9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.</p> <p>9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p> <p>9-12.S.2.1 ~ Students are able to describe immediate and long term consequences of potential solutions for technological issues.</p> <p>9-12.S.2.2 ~ Students are able to analyze factors that could limit technological design.</p> <p>9-12.S.2.3 ~ Students are able to analyze and describe the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.</p>
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Teacher: Core Chemistry

Year: 2008-2009

Course: Chemistry

S E P T E M B E R	General Chemistry		
	Content	Skills	Standards
	Definition of chemistry	Define chemistry	9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.
	Areas of chemistry	List the five areas of chemistry	
	Scientific Method	Explain the importance of chemistry	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
		Define scientific method	9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.
		List and perform the steps of the scientific method	
		Contrast the difference between scientific theory and law	
		Define hypothesis	
	Apply the scientific method to real world problems		
Matter			
Content	Skills	Standards	
States of matter	Define matter terms	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.	
Types of matter	Distinguish between states of matter	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.	
Type of property and change	Diagram how matter is broken down		
Chemical reaction	Perform a lab on mixtures	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.	

	<p>Distinguish between chemical and property</p> <p>Distinguish between element and compound</p> <p>Perform a lab on chemical and physical properties</p> <p>Distinguish between homogeneous and heterogeneous mixture</p>	<p>9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter</p> <p>9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.</p>
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OCTOBER

Atoms

Content	Skills	Standards
<p>Famous chemists and experiments</p> <p>Structure of the atom</p> <p>Types of numbers</p> <p>Periodic table</p> <p>Electron configuration and orbital</p>	<p>Research and write a paper on a famous chemist and his/her contribution to chemistry</p> <p>Identify and illustrate the parts of the atom</p> <p>Describe important experiments</p> <p>Explain terms pertaining to the atom (i.e. atomic number)</p> <p>Construct electron configurations</p> <p>Perform a lab on atomic structure</p> <p>Articulate the structure of the periodic table</p>	<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter</p> <p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p>

NOVEMBER	Chemicals		
	Content	Skills	Standards
Compounds	Distinguish between ionic and molecular compounds	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.	
Ions	Define cation and anion and relate them to metal and non metal	9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.	
Formulas	Distinguish among chemical formulas, molecular formulas, and formula units	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.	
Chemical equations	Understand the law of definite and multiple proportions	9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.	
Chemical reactions	Determine the charge on an ion by using the periodic table		
Oxidation numbers	Define polyatomic ion		
	Name and find formulas of polyatomic ions, molecular compounds, and acids		
	Apply the rules for naming ionic compounds		
	Write and balance chemical equations		
	Identify different types of chemical reactions		
	Differentiate between oxidation and reduction reactions		

	Determine oxidation numbers Define certain terms dealing with the areas of content Perform a lab on ions	
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DECEMBER **Stoichiometry**

Content	Skills	Standards
Mole Molar mass Mole ratio	Describe Avogadro's number Calculate the mass of a mole of any substance Calculate mole ratios Apply mole ratios to stoichiometric calculations Calculate stoichiometric quantities Define stoichiometry Perform a lab on stoichiometry	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations. 9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques. 9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.

JANUARY **States**

Content	Skills	Standards
Gases Liquids	Describe the motion for gas particles according to the kinetic theory	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to

Solids	Interpret the idea of gas pressure	design and conduct student investigations.
	Describe the attractive forces of a liquid	9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.
	Differentiate between evaporation and boiling of a liquid	9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter
	Describe the organization of particles in all three states of matter	
	Distinguish between a crystal lattice and a unit cell	
	Describe the properties of gases	
	Explain and create a book on the different gas laws	
	Discuss the factors affecting gas pressure	
	Distinguish the difference between ideal and real gas	
	Calculate the amount of gas given in a problem	
	Calculate the moles, masses, and volumes of gases at STP	

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Bonding

Content

Skills

Standards

U A R Y	Ionic bonding	Infer the number of valence electrons in an atom and draw its electron dot structure	
	Covalent bonding	Describe the formation of cations from metals	
		Describe the formation of anions from nonmetals	
		List the characteristics of an ionic bond	
		Draw the formation of single, double, and triple covalent bonds	
		Describe and give examples of coordinate covalent bonding and resonance structures	
		Explain the different types of covalent bond theories like VSEPR theory	
		Classify a bond as either covalent, polar covalent, or ionic	
		Name and describe the weak attractive forces that hold groups	

	<p>of molecules together</p> <p>Perform a lab on ionic or covalent bonds</p> <p>Define terms associated with ionic and covalent bonds</p>	
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M A R C H	Acids and Bases	
	Content	Skills
	<p>Reaction Rates</p> <p>Acids and Bases</p> <p>pH scale</p>	<p>Explain what is meant by the rate of a chemical reaction</p> <p>Describe how the rate of a chemical reaction can be influenced by certain conditions</p> <p>Define certain terms dealing with the reaction rates</p> <p>Define acids and bases</p> <p>List the properties of acids and bases</p> <p>Describe the pH scale</p> <p>Classify substances as either acidic, basic, or neutral</p> <p>Recognize the idea of hydroxide and hydronium ions</p>
		<p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter</p> <p>9-12.P 1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p>

	Perform a lab on acids and bases Describe a neutralization reaction	
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APRIL Solutions

Content	Skills	Standards
Water Types of solution Concentrations of solutions	Explain hydrogen bonding in water Describe high surface tension and low vapor pressure of water Clarify why water has a high heat of vaporization and high boiling point Distinguish among strong electrolytes, weak, electrolytes, and nonelectrolytes List the properties of solutions Calculate the solubility of a gas in a liquid Solve problems involving the molarity of a solution Define terms associated with water and solutions Perform a lab on solutions	9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations. 9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques. 9-12.P 1.0 ~ Describe structures and properties of, and changes in, matter

Teacher: Core Anatomy & Physiology

Year: 2007-2008

Course: Anatomy & Physiology

Introduction to Anatomy & Physiology		
Content	Skills	Standards
Careers that utilize a knowledge of human anatomy and physiology.	List ten careers utilizing anatomy and physiology.	

Introduction to Anatomy & Physiology		
Content	Skills	Standards
History of Anatomy & Physiology Classroom safety procedures and locations of safety equipment familiarization. Anatomical Directions, Planes of Dissection, Body Cavities, and Body Surface Regions.	Identify the importance of Hippocrates, Galen, DiVinci, Vesalius, and Harvey in the development of historical knowledge of anatomy and physiology. Read and pass a quiz over classroom safety procedures and the location of equipment in the classroom. Define the anatomical directions. Label body cavities, planes of dissection, and body surface regions.	9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things. 9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge. 9-12.NS.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. 9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws. 9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations. 9-12.NS.2.1 ~ Students are able to apply science process skills to

		<p>design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science, technology, environment, and society.</p>
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Chemistry of the Human Body

Content	Skills	Standards
<p>Matter and energy</p> <p>Matter: atoms, molecules and compounds</p> <p>Chemical bonding</p> <p>Biochemistry and the macromolecules.</p>	<p>Familiarity and Use of the Periodic Table.</p> <p>Identify chemical structures that contribute to atomic bonding.</p> <p>Recognize the relationship between monomers and polymers.</p> <p>List and state the importance of the four macromolecules.</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.P.3.0 ~ Analyze interactions of energy and matter.</p> <p>9-12.P.3.1 ~ Students are able to describe the relationships among potential energy, kinetic energy, and work as applied to the Law of Conservation of Energy.</p> <p>9-12.P.1.0 ~ Describe structures and properties of, and changes in, matter</p>

		<p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p> <p>9-12.P 1.2 ~ Students are able to describe ways that atoms combine.</p> <p>9-12.P 1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p> <p>9-12.P 1.4 ~ Students are able to balance chemical equations by applying the Law of Conservation of Matter.</p> <p>9-12.P 1.5 ~ Students are able to distinguish among chemical, physical, and nuclear changes.</p>
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Cell Biology and Tissues of the Body

Content	Skills	Standards
<p>Cells: structures and functions of the nucleus, cytoplasm, and plasma membrane</p> <p>Cell structures and their role in diseases.</p> <p>Types and functions of body tissues.</p>	<p>List and describe three major parts (nucleus, cytoplasm, plasma membrane) of the cell.</p> <p>Identify and relate the structures and functions of the plasma membrane</p> <p>List the four primary tissue types (nervous, muscle, epithelial, and connective tissues) and explain how they differ structurally and functionally.</p> <p>Describe the chief locations of the</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.1.3 ~ Students are able to identify structures and function relationships within major taxa.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.2.2 ~ Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</p>

	<p>various tissue types in the body.</p>	<p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.P 1.1 ~ Students are able to use the Periodic Table to determine the atomic structure of elements, valence number, family relationships, and regions (metals, nonmetals, and metalloids).</p> <p>9-12.P 1.2 ~ Students are able to describe ways that atoms combine.</p> <p>9-12.P 1.3 ~ Students are able to predict whether reactions will speed up or slow down as conditions change.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and</p>
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responsibilities of scientists and scientific research.

9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.

9-12.S.2.1 ~ Students are able to describe immediate and longterm consequences of potential solutions for technological issues.

Skin and Body Membranes

Content	Skills	Standards
<p>Body Membranes, Integumentary system structures, skin color, hair and nails</p> <p>Hemostatic imbalances of the skin and skin diseases</p> <p>Burns and cancers.</p>	<p>Identify layers and structures of the skin.</p> <p>Name three ways in which skin color can signal certain diseases.</p> <p>Name two types of glands found in the skin.</p> <p>Recognize common terminologies of infections and allergies of the skin.</p> <p>Assess skin discolorations and disorders using the ABCD rule</p> <p>Utilize the rule of nines for burn patient assessment.</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p>

Skin and Body Membranes

Content	Skills	Standards
<p>Functions and structures of cutaneous, mucous, serous, and synovial membranes.</p> <p>Common diseases and injuries that affect the skin including burns, cancers, scrapes, blisters and discolorations.</p> <p>Developmental aspects of the integumentary system with special emphasis on aging.</p>	<p>List four functions of the integumentary system.</p> <p>Recognize and identify major structures including the dermis, epidermis, hair and hair follicles, and glands on a model or diagram of the skin.</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p>

The Skeletal System

Content	Skills	Standards
<p>Microscopic and macroscopic characteristics of bone.</p> <p>Functions and structures of the skeletal system.</p> <p>Formation and development of the skeletal system.</p> <p>Structures and functions of Joints.</p> <p>Diseases and Damage of the skeletal system.</p>	<p>Label the bones correctly on a diagram of the human skeleton.</p> <p>List five functions of the skeleton.</p> <p>Label the microscopic anatomy of a bone on a diagram.</p> <p>Relate each bone to whether it occurs in the axial skeleton or appendicular skeleton.</p> <p>List the types of common fractures of the bone.</p> <p>Describe the major developmental changes that occur in the skeleton</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.1.2 ~ Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p>

from infancy to old age.

Composition and Functions of Blood

Content	Skills	Standards
<p>The composition and functions of whole blood.</p> <p>Structures and function(s) of formed elements and plasma..</p> <p>Common diseases of the blood and their causes.</p> <p>Clotting cascade of the blood and factors inhibiting or enhancing clotting.</p> <p>Four major blood types of the ABO system and why transfusion reactions occur.</p>	<p>Describe the composition and functions of whole blood.</p> <p>List the formed elements (WBC's, RBC's, platelets) and give the function(s) of each.</p> <p>Relate common diseases of blood and their causes.</p> <p>Write a paragraph describing the ABO blood typing system and the physical basis for the clotting of the blood.</p>	<p>9-12.E.1.1 ~ Students are able to explain how elements and compounds cycle between living and non-living systems.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p>

The Circulatory System

Content	Skills	Standards
<p>Location, structures, and physiology of the heart.</p> <p>Locations, structures and functions of the arteries, veins, and capillaries.</p> <p>Structures and functions of the</p>	<p>Name and place the four major chambers and valves of the heart, and trace the directions of the two major circulations (pulmonary & systemic) on a diagram of the heart and circulatory system.</p> <p>Name and describe three major</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.1.2 ~ Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</p>

<p>lymphatic system.</p>	<p>problems or diseases that impair the function of the heart.</p> <p>Identify the major veins and arteries of the body on a diagram..</p> <p>Identify the physiologic origins and importance of blood pressure and common problems associated with hypertension.</p> <p>List four major organs of the lymphatic system and to describe it basic functions.</p>	<p>9-12.L.1.3 ~ Students are able to identify structures and function relationships within major taxa.</p> <p>9-12.L.2.0 ~ Analyze various patterns and products of natural and induced biological change.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p> <p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p> <p>9-12.S.2.0 ~ Analyze the relationships/interactions among science,</p>
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		<p>technology, environment, and society.</p> <p>9-12.S.2.1 ~ Students are able to describe immediate and longterm consequences of potential solutions for technological issues.</p>
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Body Defenses - The Immune System

Content	Skills	Standards
Structures and functions of the nonspecific body defenses.	Identify four major nonspecific body defenses that play critical roles in defending the body.	
Structures and Functions of the Specific Body Defenses.	Identify key differences between B and T cells and relate those differences to their roles in fighting disease.	

The Nervous System

Content	Skills	Standards
Functions and structures of the nervous system.	Describe the functions of the nervous system and to identify key similarities and differences between the CNS and PNS.	9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.
Structures and functions of nervous tissue.	Label the major structural parts of the nervous system on a diagram.	9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.
Structures, functions and physiology of the Central Nervous System.		9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.
Structures, functions and physiology of the peripheral		9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.

nervous system.		<p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.1 ~ Students are able to apply science process skills to design and conduct student investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p>
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Cat Dissection & Muscular System

Content	Skills	Standards
<p>Shape and location of major organ systems of the mammalian body.</p> <p>Techniques of safe laboratory dissections.</p> <p>Key functions, locations and structures of the skeletal muscles.</p>	<p>Identify the major organs found within the abdominal cavity of a mammal.</p> <p>Perform a mammal dissection using basic & safe techniques.</p>	<p>9-12.L.1.0 ~ Understand the fundamental structures, functions, classifications, and mechanisms found in living things.</p> <p>9-12.L.1.1 ~ Students are able to relate cellular functions and processes to specialized structures within cells.</p> <p>9-12.L.1.2 ~ Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</p> <p>9-12.L.1.3 ~ Students are able to identify structures and function relationships within major taxa.</p> <p>9-12.L.3.0 ~ Analyze how organisms are linked to one another and the environment.</p>

		<p>9-12.NS.1.0 ~ Understand the nature and origin of scientific knowledge.</p> <p>9-12.NS.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.</p> <p>9-12.NS.1.2 ~ Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p> <p>9-12.NS.2.0 ~ Apply the skills necessary to conduct scientific investigations.</p> <p>9-12.NS.2.2 ~ Students are able to practice safe and effective laboratory techniques.</p> <p>9-12.S.1.0 ~ Analyze various implications/effects of scientific advancement within the environment and society.</p> <p>9-12.S.1.1 ~ Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p> <p>9-12.S.1.2 ~ Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p>
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Teacher: Core Physics

Year: 2008-2009

Course: Physics

Physics

Content	Skills	Standards
Significant figures Scientific notation Conversion factors Accuracy Precision Graphs	Define physics Apply significant figures to physic problems Convert between different units Explain the difference between precision and accuracy Convert a number into scientific notation	

Motion

Content	Skills	Standards
Diagrams Coordinate system Velocity Acceleration	Define terms associated with motion Draw a motion diagram and particle model Differentiate between scalar and vector quantities	

Vectors	Solve problems using vectors	
Graphs for motion	Interpret a graph for motion	
	Understand the idea of gravity and free fall	
	Perform labs dealing with motion	
	Apply motion concepts to the roller coaster project	

Forces

Content	Skills	Standards
Forces	Define a force and differentiate between contact and long-range forces	
Newton's laws		
Equilibrant	Explain Newton's laws and apply to everyday events	
Circular motion		
Projectile	Solve problems using the equation from Newton's second law	
Impulse	Define the friction force and distinguish between kinetic and static friction	
Momentum		
Law of Conservation of Momentum	Define equilibrant	
Friction	Define projectile and determine the motion of projectile	

	<p>Explain the acceleration of an object moving in a circle and what it depends on</p> <p>Define momentum and impulse</p> <p>Solve equations using impulse and momentum</p> <p>Relate Newton's third law of motion to understand conservation of momentum problems</p> <p>Construct a car using Newton's third law to win class car races</p> <p>Analyze the movie "Apollo 13" and evaluate how forces are used in the movie</p> <p>Build a trebuchet to launch a projectile a certain distance by applying projectile information</p>	
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Energy		
Content	Skills	Standards
Machine	Describe the relationship between energy and work	
Energy	Explain difference between kinetic and potential energy	
Power	Perform lab on work and power	
Work		

Mechanical advantage	Perform a lab on simple machine	
Potential energy	Explain the difference between simple and compound machine	
Kinetic energy		
Collision	Understand the concept of efficiency for a machine	
Law of Conservation of Energy	Use a model to relate work and energy	
Differentiate between work and power	Explain different types of potential energy	
	Solve problems using the law of conservation of energy	
	Analyze collisions to find the change in kinetic energy	

Waves

Content	Skills	Standards
Wave	Label parts of a wave	
Transverse wave	Explain the difference between transverse and longitudinal wave	
Longitudinal wave	Define wave	
Interference	Calculate speed, frequency and wavelength of a wave	
Reflection		
Refraction	Describe how waves are reflected and refracted boundaries between media and explain how waves	

Pitch	diffract	
Beat	Demonstrate knowledge of the nature of sound waves and the properties sound shares with other waves	
Sound		
Light	Define Doppler, shift, and identify some of its applications	
	Describe the ray model of light	
	Explain the formation of light by pigments dyes	

Mirrors and Lenses

Content	Skills	Standards
Refraction	Explain the Law of Reflection	
	Perform lab with mirrors and lens	
Reflection	Explain dispersion of light in terms of the index of refraction	
Mirror	Define critical angle	
Lens	Explain how concave, convex, and plane mirrors form images	
Diffraction		
Interference	Relate the diffraction of light to its wave characteristics	
	Explain how diffraction grating form interference patterns	

Electricity		
Content	Skills	Standards
Conduction	Recognize that objects exert forces.	
Induction		
Coulomb's Law	Describe the difference between insulator and conductor	
Electric field	Explain how to charge by conduction and induction	
Current	Summarize the relationship between forces and charges	
Circuit	Define and measure an electric field	
	Describe capacitance and solve problems	
	Define an electric current and the ampere	
	Draw circuits and define power in electric circuits	
	Define resistance and describe Ohm's law	
	Perform lab on electricity with parallel and series circuits	
	Explain the difference between parallel and series circuits	

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Magnets and Magnetism

Content	Skills	Standards
Magnetic fields Electromagnetic induction Electromagnetism	Describe the properties of magnets Relate the magnetic induction to the direction of the force Explain how a changing magnetic field produces an electric current Solve problems involving voltage and current State Lenz's Law Describe how electric and magnetic fields can produce more electric and magnetic fields	

Atom

Content	Skills	Standards
Quantum Theory	Differentiate between Bohr Model and the Quantum Model Explain the Quantum Theory	

Bohr Model		
Quantum Model		