

Campbell County School District # 1
Gillette, Wyoming

Science - Grade 7

This course is the beginning strand of a suggested three-year science progression. It will include studies in the areas of physics, chemistry, earth science, and biology. The course utilizes an inquiry approach to learning, with an emphasis on process and product. Activities are designed for the developmental level of the seventh-grade student. Testing, lab procedures, and journalizing determine accountability.

Textbook/Resources: Holt Science and Technology Short-Course series, 2002

SC-07-01 PHYSICAL SCIENCE (Content Standard)

State Standard and Benchmark Correlation:

- SC8.1.10 Structure and Properties of Matter
- SC8.1.12 Forms and Uses of Energy
- SC8.1.14 Effects of Motions and Forces

The students will explain and illustrate the basic principles of physical science.

ASSESSMENT: A written test (percent score) will be used to evaluate the students' level of understanding.

SC-07-01-01 - Forces, Motion, Work (Objective)

C - Critical--Assessment Reporting Required

Students will measure forces, motion, and work, and will distinguish between potential and kinetic energy:

- Identify and describe forces such as gravity, friction, and magnetism
- Describe speed and velocity
- Calculate work
- Describe and apply Newton's Laws

SC-07-01-02 - Properties of Matter (Objective)

C - Critical--Assessment Reporting Required

Students will describe the particle theory, with emphasis upon:

- States of matter
- Physical properties
- Changes of state
- Density

SC-07-02 LIFE SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- SC8.1.1 Levels of Organization in Living Systems
- SC8.1.2 Reproduction and Heredity

The students will explain and illustrate the basic principles of life science.

ASSESSMENT: A written test (percent score) will be used to evaluate the students' level of understanding.

SC-07-02-01 - Organ Systems (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate an understanding of organ systems by analyzing the structure and function of an organ system. Students will describe the levels of organization of a human body system.

SC-07-02-02 - Heredity (Objective)

C-CS - Critical-Assessment at Content Standard

Students will use the basic laws of Mendelian genetics to solve monohybrid crosses and will use Punnet squares to interpret traits and patterns of inheritance.

SC-07-03 EARTH AND SPACE SCIENCE (Content Standard)

S - Supporting

State Standard and Benchmark Correlation:

none

The students will explain and illustrate the basic principles of earth and space science.

SC-07-03-01 - Cycles in Earth's Systems (Objective)

S - Supporting

Students will diagram and illustrate carbon cycles and water cycles.

SC-07-03-02 - Properties of Earth's Atmosphere (Objective)

S - Supporting

Students will describe properties of the atmosphere with an emphasis on weather.

SC-07-04 SCIENTIFIC METHOD (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.1 Research Scientific Info, Present Findings

SC8.2.2 Use Inquiry to Conduct Scientific Investigations

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

The students will demonstrate proper use of scientific method.

ASSESSMENT: A rubric will be used to evaluate the students' level of understanding. The rubric will be related to the specific experience of projects developed in the classroom.

SC-07-04-01 - Proper Use of Scientific Method (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate proper use of scientific method.

SC-07-04-02 - Conduct an Experiment, Report, Analyze (Objective)

C-CS - Critical-Assessment at Content Standard

Students will conduct a scientific experiment, and they will report and analyze the data obtained.

SC-07-04-03 Identify a Variable (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify a variable.

SC-07-05 TECHNOLOGY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

The students will utilize technology to collect, store, manipulate, and present information.

ASSESSMENT: A rubric will be used to evaluate the students' level of understanding. The rubric will be related to the specific expectations of projects developed in the classroom.

SC-07-05-01 - Utilizing Technology (Objective)

C-CS - Critical-Assessment at Content Standard

The students will effectively use appropriate technologies for collecting, analyzing, and communicating information. This may include but not be limited to the following hardware and software, computers, video recorders, microscopes, video microscopes, probes, camcorders, electronic still cameras, word processing program, presentation program, and electronic reference materials.

last update 3/27/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Grade 8

This course continues the integration of physics, chemistry, earth science, and biology that began in seventh grade. The course utilizes an inquiry approach to learning, with an emphasis on process and product. New activities in these areas will expand the concepts studied at the seventh-grade level and are designed for the developmental level of the eighth-grade student. Testing, lab procedures, and journalizing determine accountability.

Textbook/Resources: Holt Science and Technology Short-Course series, 2002

SC-08-01 PHYSICAL SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- SC8.1.10 Structure and Properties of Matter
- SC8.1.11 Physical and Chemical Changes in Matter
- SC8.1.13 Conservation of Matter and Energy

The students will explain and illustrate the basic principles of physical science.

SC-08-01-01 - Particle Theory (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe and distinguish between both physical and chemical properties and physical and chemical changes.

Essential Content:

- Solubility
- Conservation of Mass
- Mixtures/Compounds
- pH
- Chemical potential energy

SC-08-01-02 - Convection, Conduction, and Radiation (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe or illustrate convection, conduction, and radiation processes.

Essential Content:

- Atmosphere
- Plate tectonics
- Ocean currents

SC-08-02 LIFE SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- SC8.1.4 Diversity of Organisms
- SC8.1.5 Behavior and Adaptation
- SC8.1.6 Interrelationships of Populations/Ecosystems

The students will explain and illustrate the basic principles of life science.

SC-08-02-01 - Adaptation of Organisms to Environmental Changes (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe how organisms adapt and respond to changes in their

environment.

Essential Content: • Populations • Extinction
• Limiting factors • Human factors
• Adaptations

SC-08-03 EARTH SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.8 The Structure of the Earth System

SC8.1.9 The Earth's History

The students will explain and illustrate the basic principles of earth science.

SC-08-03-01 - Plate Tectonics (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the processes and results of plate tectonics.

Essential Content:

- Volcanoes
- Earthquakes
- Changes over time
- Plate boundaries
- Rock and Mineral identification
- Land forms
- Rock cycle
- Time lines
- Fossil records

SC-08-04 SPACE SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.7 The Earth in the Solar System

SC-08-04-01 - Interaction of Solar System Components (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the major components of our solar system and their interaction.

Essential content:

- Planets
- Asteroids
- Moon phases
- Comets
- Exploration
- Satellites
- Sun

SC-08-05 SCIENTIFIC METHOD (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.1 Research Scientific Info, Present Findings

SC8.2.2 Use Inquiry to Conduct Scientific Investigations

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

The students will demonstrate proper use of scientific method.

ASSESSMENT: A rubric will be used to evaluate the students' level of understanding. The rubric will be related to the specific experience of projects developed in the classroom.

SC-08-05-01 - Proper Use of Scientific Method (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate the proper use of scientific method.

SC-08-06 TECHNOLOGY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

The student will utilize technology to collect, store, manipulate, and present information.

ASSESSMENT: A rubric will be used to evaluate the student's level of understanding. The rubric will be related to the specific expectations of projects developed in the classroom.

SC-08-06-01 Utilizing Technology (Objective)

C-CS - Critical-Assessment at Content Standard

The students will effectively use appropriate technologies for collecting, analyzing, and communicating information. This may include but not be limited to the following hardware and software: computers, video recorders, microscopes, video microscopes, probes, camcorders, electronic still cameras, word processing, presentation program, multimedia,, and electronic reference materials.

last update 3/27/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Grade 9

This course culminates a three-year program of integrated science, utilizing an inquiry approach to learning with an emphasis on process and product. Activities in the areas of physics, chemistry, earth science, and biology are designed with the developmental level of the ninth-grade student in mind and build upon the concepts studied in grades seven and eight. Students completing this course will have a very strong knowledge base in all areas of science and will be well prepared for success in all high school science courses. This class is highly recommended for all ninth-grade students. Accountability is determined by testing, lab procedures, and journalizing.

Textbook/Resources: Holt Science and Technology Short-Course series, 2002

SC-09-01 PHYSICAL SCIENCE - PHYSICS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.14 Motions and Force

The students will explain and illustrate the basic principles of motion and force.

ASSESSMENT: written test/percent score

SC-09-01-01 - Measure and Calculate Velocity, Acceleration, and Force (Objective)

C-CS - Critical-Assessment at Content Standard

The students will measure and calculate velocity, acceleration, and force.

SC-09-01-02 - Mass, Force, and Acceleration (Objective)

C-CS - Critical-Assessment at Content Standard

The students will explore the relationship between mass, force, and acceleration

SC-09-02 PHYSICAL SCIENCE - CHEMISTRY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

The students will explain and illustrate the basic principles of chemistry.

ASSESSMENT: written test/percent score

SC-09-02-01 - Structure of an Atom (Objective)

S - Supporting

The students will describe the structure of an atom and the location of its parts.

SC-09-02-02 - Physical vs. Chemical Changes and Properties (Objective)

S - Supporting

The students will distinguish between physical and chemical changes and properties, and they will explore chemical reactions.

SC-09-02-03 - Measurement of Matter (Objective)

S - Supporting

The students will measure length, mass, and volume, and they will calculate density.

SC-09-03 LIFE SCIENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC.11.1.4 Interdependence of Organisms

SC.11.1.5 Matter, Energy, Organization in Living Systems

SC.11.2.1 Research Scientific Info.: Present Findings Appropriately

SC.11.3.2 Examine Use of Scientific Info for Decision-Making

The students will explain and illustrate the basic principles of life science.

ASSESSMENT: rubric score

SC-09-03-01 - Interdependence of Organisms (Objective)

C-CS - Critical-Assessment at Content Standard

The students will investigate the flow of energy and nutrients within an ecosystem.

SC-09-03-02 - Structure/Function of Plant and Animal Cells (Objective)

S - Supporting

The students will identify the structure and function of plant and animal cells and their parts.

SC-09-03-03 Cells' Response to Their Environment (Objective)

S - Supporting

The students will describe ways that cells respond to their environment, including:

- active transport
- passive transport

SC-09-03-04 - Inheritance of Traits (Objective)

S - Supporting

The students will describe the process required for the inheritance of traits in an organism, including:

- cell division
- sexual/asexual reproduction
- the gene concept

SC-09-04 EARTH SCIENCE (Content Standard)

C - Critical - Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

The students will explain and illustrate the basic principles of earth and space science.

ASSESSMENT: written test/percent score

SC-09-04-01 - Geochemical Cycles (Objective)

C-CS - Critical-Assessment at Content Standard

The students will diagram two geochemical cycles and explain their importance:

- nitrogen
- carbon/oxygen

SC-09-04-02 - Global Energy and Climate (Objective)

C-CS - Critical-Assessment at Content Standard

The students will explain weather and global climate in terms of energy transfer.

SC-09-05 SPACE SCIENCE (Content Standard)

C - Critical - Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

The students will describe the processes of star formation and evolution, and explore the Big Bang Theory.

ASSESSMENT: written test/percent score

SC-09-05-01 - Star Formation & Evolution (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the processes involved in star formation, evolution, and destruction.

SC-09-05-02 – The Big Bang Theory (Objective)

C-CS - Critical-Assessment at Content Standard

The students will examine evidence for the Big Bang Theory.

SC-09-06 SCIENTIFIC METHOD (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

The students will demonstrate proper use of scientific method.

ASSESSMENT: written test/percent score.

SC-09-06-01 - Conduct an Experiment--Analyze and Report Data (Objective)

C-CS - Critical-Assessment at Content Standard

The students will conduct an experiment, and they will analyze and report the data.

last update 3/27/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Advanced Biology

This class will explore introductory biochemistry, advanced genetics, and introductory microbiology. Advanced Biology is designed for students who are looking for additional background in biology beyond general biology. The course is designed to give students the opportunity to do laboratory work culturing, staining, fixing, and identifying microorganisms. Students will also have the opportunity to research and evaluate recent advances in genetics. Students will be introduced to electrophoresis and other DNA and RNA analysis techniques. Additionally, students will be introduced to basic biochemical reactions and pathways. Prerequisite: Average or better grade in General Chemistry and Biology, or instructor approval. **Textbook:** Biology, Prentice Hall, 2004

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-AB-01 DNA (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

SC11.1.2 Molecular Basis of Heredity

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.4 Role of Science/Technology in Meeting Human Needs

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will identify the structure and function of DNA and will relate this knowledge to a variety of modern fields.

SC-AB-01-01 - Molecular Mechanisms of Heredity (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the processes of replication, transcription, and translation.

SC-AB-01-02 - DNA Applications (Objective)

C-NR - Critical-District Reporting Not Required

The students will relate the coded sequence of genes in the DNA molecule to genetic engineering, forensic science, medicine, agriculture, and discoveries in evolutionary science.

SC-AB-02 MENDELIAN GENETICS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.2 Molecular Basis of Heredity

SC11.3.1 Examine Nature and History of Science

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will explore the historical development of genetics and apply genetics concepts to modern problems.

SC-AB-02-01 - Mendel (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate the contributions of Gregor Mendel to the field of genetics.

SC-AB-02-02 - Chromosomal Genetics (Objective)

C-NR - Critical-District Reporting Not Required

The student will understand that characteristics are passed on via genes located on chromosomes and predict the results of genetic crosses. Students will apply this knowledge to human chromosomal/genetic disorders.

SC-AB-03 MICROBIOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will investigate bacteria, viruses, and their impact on modern biology.

SC-AB-03-01 - Microbes (Objective)

C-NR - Critical-District Reporting Not Required

The students will culture microbes, differentiate between bacteria and viruses, differentiate between prokaryotes and eukaryotes, and describe mechanisms of infection and the impact of microbes on other life forms. Students will differentiate between sexual and asexual reproduction.

last update 6/23/2009

pc

**Campbell County School District #1
Gillette, Wyoming**

**SCIENCE
ADVANCED CHEMISTRY (CCHS)**

Advanced Chemistry will be a continuation of General Chemistry with strong emphasis on laboratory work and procedures.

Prerequisite: Average grade in General Chemistry

Textbook: Modern Chemistry - Holt, 2004

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-AD-01 CHEMICAL KINETICS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

Students will demonstrate an understanding of the collision theory.

SC-AD-01-01 - Collision Theory of Reaction (Objective)

C-NR - Critical-District Reporting Not Required

The student will explain the collision theory of reaction. In relating the rate of a chemical reaction to the concentration of the reactants, the student will emphasize the collision theory. He will relate an increase in concentration to an increase in the number of collisions between reactants.

SC-AD-01-02 - Reaction Mechanism/Rate-Determining Step (Objective)

C-NR - Critical-District Reporting Not Required

The student will describe what is meant by a reaction mechanism and a rate-determining step. The different steps in a reaction mechanism take place at different rates. One step in a mechanism may occur almost instantaneously, while another step occurs slowly.

SC-AD-02 ENTHALPY AND ENTROPY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

SC11.1.12 Conservation of Energy and Increase in Disorder

Students will demonstrate a knowledge of how energy and disorder affect reaction rates.

SC-AD-02-01 - Interpret Changes in Enthalpy (Objective)

C-NR - Critical-District Reporting Not Required

The student will interpret changes in enthalpy. In all chemical reactions, there is a change in enthalpy; that is the total enthalpy of the products is different from the total enthalpy of the reactants.

SC-AD-02-02 - Describe the Effects of Changes in Entropy (Objective)

C-NR - Critical-District Reporting Not Required

Entropy is the measure of the disorder, randomness, or lack of organization of a system.

A system has a large entropy if it is in a great state of disorder. Changes tend to go in the direction of increasing entropy.

SC-AD-02-03 - Free Energy Equations/Spontaneous Reactions (Objective)

C-NR - Critical-District Reporting Not Required

The student will write free energy equations and use them to predict spontaneous reactions. He will write the Gibbs equation and indicate the meaning of each term. Why is the free energy change sometimes called the net driving force of a reaction? What type of free energy changes indicates that a reaction is spontaneous?

SC-AD-02-04 - Compare Heat of Reaction and Heat of Formation (Objective)

C-NR - Critical-District Reporting Not Required

The student will compare heat of reaction and heat of formation.

SC-AD-03 CHEMICAL EQUILIBRIUM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

SC11.1.12 Conservation of Energy and Increase in Disorder

Students will demonstrate an ability to derive mass-action expressions and calculate equilibrium constants.

SC-AD-03-01 - Derive Mass-Action Expressions (Objective)

C-NR - Critical-District Reporting Not Required

The student will be able to derive mass-action expressions. The mass-action expression for a reversible reaction is equal to the equilibrium constant for that reaction at a particular temperature. While the equilibrium constant can only be determined by experiment, the mass-action expression can be derived from the balanced equation for the reaction.

SC-AD-03-02 - Calculate Equilibrium Constants (Objective)

C-NR - Critical-District Reporting Not Required

The student will know the equilibrium constants as they exist in chemical reactions and the factors that affect chemical equilibrium.

SC-AD-04 SOLUBILITY PRODUCT EXPRESSION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

Students will demonstrate an ability to derive solubility-product expressions and determine solubilities.

SC-AD-04-01 - Derive Solubility-Product Expressions (Objective)

C-NR - Critical-District Reporting Not Required

The student will derive solubility-product expressions. The solubility-product expression is the expression that shows what ion concentrations raised to appropriate powers produce the solubility-product constant.

SC-AD-04-02 - Determine Solubilities Fr. Solubility Products (Objective)

C-NR - Critical-District Reporting Not Required

The student will determine solubilities from solubility products. He will predict the formation of precipitates from a knowledge of ion concentrations.

SC-AD-05 OXIDATION-REDUCTION REACTIONS (Content Standard)

State Standards Correlations:

none

Students will demonstrate an ability to balance redox reactions.

SC-AD-05-01 - Balance Redox Equations (Objective)

C-NR - Critical-District Reporting Not Required

The student will be able to balance redox equations. The underlying principle used in balancing redox equations is that the total decrease in oxidation number must be equal to the total increase.

SC-AD-05-02 - Identify Ions From Solutions (Objective)

C-NR - Critical-District Reporting Not Required

The student will identify ions from solutions. By utilizing the solubility product, the student will identify cations and anions in a solution.

last update 6/22/2009

pc

Campbell County School District #1 Gillette, Wyoming

SCIENCE - APPLIED PHYSICS

The central idea of the Applied Physics curriculum is to present unifying concepts in the study of basic energy systems: mechanical, fluid, electrical, and thermal. Algebra is used as a tool of Science, while lab work provides opportunities to apply the concepts of the class.

Textbook: Principles of Technology - CCI Publishing, 1990

SC-AP-01 FORCE (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate an understanding of the concept of force and give examples of technological devices where force must be controlled, measured or applied. They will identify the force or force-like quantity within the four basic energy systems: mechanical (both linear and rotational,) fluid, electrical and thermal.

SC-AP-01-01 - Force (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- measure forces in the mechanical, fluid, electrical or thermal system.
- differentiate between vector and scalar quantities.
- demonstrate the ability to draw a representative vector to scale for a given quantity.
- graphically add multiple vectors.
- describe what happens to an object when forces are balanced or unbalanced.

SC-AP-02 WORK (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will describe what is meant by work and apply the universal equation of work to the four basic energy systems: mechanical (both linear and rotational,) fluid and electrical.

SC-AP-02-01 - Work (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- calculate work in the mechanical, fluid, electrical or thermal system.
- calculate the efficiency of a system.

SC-AP-03 RATE (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate an understanding of the concept of rate and differentiate between speed, velocity and acceleration. Students will apply the universal equation of rate while learning about rate within the four basic energy systems: mechanical (both linear and rotational,) fluid, electrical and thermal.

SC-AP-03-01 - Linear and Rotational Velocity and Acceleration (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- determine the average velocity and acceleration of a linear and rotational moving object.
- solve simple two-dimensional velocity and acceleration problems.

SC-AP-03-02 - Newton's Three Laws (Objective)

C-NR - Critical-District Reporting Not Required

Students will demonstrate an understanding of Newton's three laws of motion and how they impact human activity on a practical basis.

The students will:

- demonstrate an ability to apply the three laws of motion to real situations.
Law 1 - An object moving in a straight line will continue moving in a straight line, unless acted on by an outside force. Also, an object at rest will stay at rest.
Law 2 - Force will cause a change in the motion of an object. The change in motion depends on the amount of force and the mass of the object. $F=ma$
Law 3 - For each action, there is an equal and opposite reaction.
 - Calculate simple force problems using the second law
 - Describe the difference between weight and mass.
 - Understand the concept of friction as a resistance to maximum efficiency.

SC-AP-04 RESISTANCE (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Student will describe what is meant by resistance in general. They will apply the universal equation of resistance to the other energy systems and identify good and bad effects of resistance in each energy system.

SC-AP-04-01 - Resistance (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- measure the resistance in all energy systems.
- differentiate between normal force, frictional force and applied force.
- differentiate between static and kinetic friction.
- Identify the controlling factors of friction in each system.
- distinguish between streamlined and turbulent flow.
- apply Ohms Law and determine value of electrical resistors.

SC-AP-05 ENERGY AND CONSERVATION OF ENERGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate an understanding of the concept of energy and its conservation as well as differentiate between potential and kinetic energy. Students will apply the universal equation of energy while learning about energy within the four basic energy systems: mechanical (both linear and rotational,) fluid, electrical and thermal.

SC-AP-05-01 Conservation of Energy (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- calculate the energy of the basic systems by applying the universal equation of energy.
- describe the relationship between work and energy.
- describe the relationship between potential energy, kinetic energy and heat energy in the conservation-of-energy law.
- understand the concept of inertia.

SC-AP-06 POWER (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate an understanding of the concept of power. Students will apply the universal equation of power while learning about power within the four basic energy systems: mechanical (both linear and rotational,) fluid, electrical and thermal.

SC-AP-06-01 - Power (Objective)

C-NR - Critical-District Reporting Not Required

Students will:

- calculate power in the different energy systems.
- apply the universal equation of power the different energy systems.

SC-AP-07 FORCE TRANSFORMERS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Energy and Matter

SC11.1.14 Motions and Force

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

The students will demonstrate their understanding of the concepts associated with the mechanical system with regard to force, work, rate, resistance, energy, and power to create a force transformer in the guise of a kinetic sculpture.

SC-AP-07-01 - Force Transformers (Objective)

C - Critical--Assessment Reporting Required *DSPA #1*

Students will construct a kinetic sculpture and provide concrete evidence that they have mastered measurement, calculation, research, design, construction, and data collection and can provide a conclusive explanation of the success or failure of their kinetic sculpture.

new 7/15/2008

update 6/23/2009 Not being taught 2009-2010

pc

Campbell County School District # 1
Gillette, Wyoming

Science - Astronomy

Astronomy is designed for the student who is interested in going past the basics in stargazing. In this golden age of astronomy, the students will explore the heavens using telescopes, planetarium trips, and other classroom activities. The students will view deep space objects during nighttime sessions.

Prerequisites: Average or better grade in Earth Science, Chemistry, and Geometry.

Textbook: Project Star - Kendall/Hunt, 1993

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-AT-01 DIMENSIONAL ANALYSIS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will solve word problems.

SC-AT-01-01 - Analyze Word Problems (Objective)

S - Supporting

The students will solve word problems using the Factor Label analysis method.

SC-AT-02 TELESCOPES (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will properly use a telescope.

SC-AT-02-01 - Demonstrate Proper Set-Up of a Telescope (Objective)

C-NR - Critical-District Reporting Not Required

The students will polar align using the local latitude, select the proper eyepiece, and focus on a selected object.

SC-AT-03 SOLAR SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

none

Students will understand the solar system.

SC-AT-03-01 - Construct a Solar System Model (Objective)

S - Supporting

The students will be given the solar system dimensions, and each student will construct a scale model of the solar system including the planets, moons, comets, the nearest star, and the galactic center.

SC-AT-03-02 - Diagram and Label Lunar Phases (Objective)

S - Supporting

The students will label correctly each phase of the moon, given the sky position and time of the day.

SC-AT-04 STELLAR EVOLUTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.3 Communicate the Result of Scientific Inquiry

The students will understand stellar evolution.

SC-AT-04-01 - Analyze Stellar Evolution (Objective)

S - Supporting

The students will explain the life sequence of any star type, given a H & R diagram.

SC-AT-05 GALACTIC MORPHOLOGY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

SC11.2.1 Research Scientific Info; Present Findings

Students will understand galactic morphology.

SC-AT-05-01 - Classify the Galactic Objects (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe and identify quasars, black holes, galaxy types, clusters, and radio sources in the universe. Students will research a celestial "object" and present their findings.

SC-AT-06 COSMOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

SC11.3.1 Examine Nature and History of Science

Students will understand cosmology.

SC-AT-06-01 - Define the Universe (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the concepts of a universe that is positively, negatively, and null curved.

SC-AT-06-02 - Describe Cosmological Tests (Objective)

S - Supporting

The students will describe the methods and tests of cosmology including Obler's paradox.

SC-AT-07 EXTRA-GALACTIC COMMUNICATIONS (Content Standard)

State Standard and Benchmark Correlation:

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will understand the attempts at extra- galactic communication.

SC-AT-07-01 - Analyze the Arecibo Message (Objective)

S - Supporting

The students will describe the logic and content of our messages attempting to communicate with distant civilizations.

SC-AT-08 SCIENCE VERSUS PSEUDOSCIENCE (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.7 Connections Among the Science Disciplines

SC11.3.5 Alternative Explanations and Models

SC11.7.3 How Scientific Knowledge Evolves/Changes Over Time

SC11.8.2 Relationships Among Science, Math, Technology

Students will differentiate between science and pseudoscience.

SC-AT-08-01 - Analyze the Concept of a Pseudoscience (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe why Astrology, Palmistry, and other pseudosciences fall short of the scientific method required for a true science.

last update 6/23/2009

pc

**Campbell County School District #1
Gillette, Wyoming**

Science - Biology

9th grade - This challenging high school level course includes the study of plants, animals, microbes, genetics, and molecular biology. The primary method is lecture/discussion. This class is not recommended for all 9th-grade students; it is recommended only for the most highly motivated students.

The recommended prerequisites for choosing this course are:

- being an independent worker, as students must be prepared to do significant work outside of the regular school day.
- GPA of 3.75 or better
- STAR reading test score at or above grade level
- an A average in previous science courses
- a desire to take several upper level science courses as a high school junior or senior

Accountability is determined primarily through written exams.

CCHS - Biology is an introductory course to the Life Sciences. It is the study of plants, animals, microbes, genetics, molecular biology, etc. Laboratory work and computer technology are used to supplement what is learned in lecture and discussion.

Prerequisite: Average grade in preceding science course

WJSH - In Biology, students will examine the characteristics of living things, osmosis, diffusion, cellular respiration, genetics, and the identification of plant and animal organelles. Students will take detailed look at the identification and levels of structure of invertebrates and vertebrates. Students will work on plants and animals and their organs and functions.

Textbook: Biology - Prentice Hall, 2004

SC-BI-01 THE LIVING CONDITION (Content Standard)

State Standard and Benchmark Correlation:

none

Students will identify the characteristics of living things.

SC-BI-01-01 - Identify the Characteristics of Living Things (Objective)

S - Supporting

The students will list the characteristics of living things as being able to reproduce, adapt, require an energy source, and have an organized structure.

SC-BI-01-02 - Distinguish Between Living and Non-living (Objective)

S - Supporting

The students will compare spontaneous generation and biogenesis; discuss the formation of the theory of biogenesis; define the terms matter and energy; describe the structures of atoms and molecules; distinguish between organic and inorganic compounds; explain the function of carbohydrates, lipids, proteins, nucleic acids, and enzymes.

SC-BI-02 – CELLULAR BIOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

SC11.3.1 Examine Nature and History of Science

Students will analyze and explain cellular processes.

SC-BI-02-01 - Explain Historical Development of the Cell Theory (Objective)

S - Supporting

The students will be able to describe the historical contributions of Dujardin, Schwann, Schleiden, and Hooke to the studies of the cell; explain the cell theory; identify steps in the scientific method.

SC-BI-02-02 - Demonstrate a Knowledge of the Microscope (Objective)

S - Supporting

The students will be able to name and understand the function of the parts of a light microscope; demonstrate the preparation of wet and dry mount slides; calculate the magnification of high and low power objectives; approximate sizes of objects being viewed under the microscope.

SC-BI-02-03 - Cell Parts and Processes I (Objective)

C - Critical--Assessment Reporting Required

The students will explain the processes of life, which necessitates an understanding of the relationship between structure and function of the cell and cellular differentiation. The students will identify activities taking place in an organism related to metabolic activities in cells, including growth, regulation, transport, and homeostasis. Students will differentiate between asexual and sexual reproduction.

SC-BI-02-04 - Cell Parts and Processes II (Objective)

C - Critical--Assessment Reporting Required

The students will explain the processes of life, which necessitates an understanding of the relationship between structure and function of the cell and cellular differentiation. The students will identify activities taking place in an organism related to metabolic activities in cells, including growth, regulation, transport, and homeostasis. Students will differentiate between asexual and sexual reproduction.

SC-BI-03 HEREDITY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.2 Molecular Basis of Heredity

SC11.2.4 Role of Science/Technology in Meeting Human Needs

SC11.3.1 Examine Nature and History of Science

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will demonstrate an understanding of heredity by analyzing the mechanics of genetics.

SC-BI-03-01 - Molecular Basis of Heredity I (Objective)

C - Critical--Assessment Reporting Required

The students will understand that organisms ensure species continuity by passing genetic information from parent to offspring. They will utilize genetic information to make predictions about possible offspring. Students will apply concepts of molecular biology (CNA) to recent discoveries.

SC-BI-03-02 - Molecular Basis of Heredity II (Objective)

C - Critical--Assessment Reporting Required

The students will understand that organisms ensure species continuity by passing genetic information from parent to offspring. They will utilize genetic information to make predictions about possible offspring. Students will apply concepts of molecular biology (DNA) to recent discoveries

SC-BI-03-03 - Identify the Structure/Function of Nucleic Acids (Objective)

S - Supporting

The students will be able to describe the chemical structure and function of DNA and RNA; describe the replication of DNA; describe the roles of DNA and RNA in protein synthesis.

SC-BI-03-04 - Identify the Structure and Function of DNA (Objective)

S - Supporting

The students will know the structure and function of DNA as it relates to heredity.

SC-BI-03-05 - Explain the Historical Development of Genetics (Objective)

S - Supporting

The students will describe Gregor Mendel's work with the garden peas; list Mendel's three basic principles of heredity: Law of Segregation, Law of Dominance, and Law of Independent Assortment.

SC-BI-03-06 - Analyze the Mechanics of Genetics (Objective)

S - Supporting

The students will demonstrate how traits are inherited by using a monohybrid cross, including parents genotype, all different sex cells, appropriate punnett square, phenotypes and genotypes and both ratios of the F1. Describe mitosis, meiosis, and DNA as it relates to heredity.

SC-BI-03-07 - Identify the Mechanics of Genetics (Objective)

S - Supporting

The students will define the terms: genotype, phenotype, homozygous, heterozygous; demonstrate the use of a punnett square in a mono and dihybrid cross, incomplete dominance cross; discuss the role of heredity and environment; demonstrate how the sex is determined genetically; discuss the causes of identical and fraternal twins.

SC-BI-03-08 - Explain Chromosomal Disorders (Objective)

S - Supporting

The students will understand the mechanism of chromosomal nondisjunction; define mutation and discuss causes of mutations; demonstrate the inheritance of common human characteristics--blood type, Rh factor, tongue rolling, PTC tasting, color blindness, hemophilia, and handedness; distinguish between sex-influenced and sex-limited characteristics.

SC-BI-04 EVOLUTION, ADAPTATION, & INTERDEPENDENCE (Content Standard)

C - Critical--Assessment Reporting Required

State Standards Correlations:

SC11.1.3 Biological Evolution

SC11.1.4 Interdependence of Organisms

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.1.6 Behavior and Adaptation

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will demonstrate understanding of natural selection, adaptations, and biodiversity.

SC-BI-04-01 - Identify Evolutionary Relationships (Objective)

C-CS - Critical-Assessment at Content Standard

The students will relate similarities and differences among organisms to evolutionary relationships of species to each other and to the environment.

SC-BI-04-02 - Natural Selection (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the significance of natural selection and mutations in populations and will make predictions from genetic data, applying genetics understanding to evolution.

SC-BI-04-03 - Adaptation (Objective)

C-CS - Critical-Assessment at Content Standard

The students will identify adaptations as characteristics and behaviors of an organism that enhance its chances for survival and reproductive success in a particular environment.

SC-BI-04-04 - Biodiversity (Objective)

C-CS - Critical-Assessment at Content Standard

The students will explore biodiversity and will relate the diversity of organisms to the diversity of particular environments.

SC-BI-04-05 - Interdependence and Interaction (Objective)

C-CS - Critical-Assessment at Content Standard

The students will investigate and describe interdependence and interactions of organisms within an ecosystem.

SC-BI-05 FLOW OF ENERGY AND MATERIALS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will describe energy and nutrient flow in an ecosystem.

SC-BI-05-01 - Compare/Contrast Flow of Energy and Materials (Objective)

S – Supporting

The students will compare and contrast the flow of energy and materials in an ecosystem.

They will explain the need of living systems for a continuous input of energy, and they will describe how this is accomplished, including the roles of the trophic levels, photosynthesis, and respiration.

SC-BI-06 SCIENTIFIC INQUIRY (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will research scientific information, conduct scientific investigations, and communicate results.

SC-BI-06-01 - Scientific Investigation and Communication (Objective)

C - Critical--Assessment Reporting Required

The student will design and conduct a sound scientific investigation and appropriately report their results.

SC-BI-07 NATURE AND HISTORY OF SCIENCE (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.3.1 Examine Nature and History of Science

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will examine the nature and history of science.

SC-BI-07-01 - Scientific Contributions (Objective)

S – Supporting

The students will investigate and report upon contributions and discoveries made by scientists.

SC-BI-08 ORGANIZATION/DIVERSITY OF LIFE (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of the classification processes and how species adapt over time.

SC-BI-08-01 - Explain the Classification System (Objective)

S - Supporting

The students will be able to describe the contributions of Carolus Linnaeus to the science of taxonomy; describe the basis of scientific classification; explain the binomial nomenclature method of naming; name the groupings used in classifying living things, as kingdom, phylum, class order, family, genus, and species.

SC-BI-08-02 - Identify the Workings of a Dichotomous Key (Objective)

S - Supporting

The students will be able to develop an understanding of how dichotomous keys work; use a dichotomous key to identify a novel species.

SC-BI-08-03 - Describe the Process of Evolution (Objective)

S - Supporting

The students will describe evolution in plants and animals as changes and adaptations that occur in a species over a period of time.

SC-BI-09 DIVERSITY OF MICROORGANISMS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will understand the structure and functions of viruses and bacteria.

SC-BI-09-01 Identify the Structure and Function of Viruses (Objective)

S - Supporting

The students will be able to explain why viruses might be considered both living and non-living; describe the chemical makeup of a virus; classify viruses according to the host in which they live; describe the lytic cycle of a virulent virus; list several diseases known to have been caused by viruses.

SC-BI-09-02 - Identify the Structure and Function of Bacteria (Objective)

S - Supporting

The students will be able to describe the contributions of Pasteur to the study of microbiology; name and describe three primary shapes of bacteria; name and describe the different colonial forms of bacteria; list the conditions for bacterial growth; describe bacterial growth; list and discuss the different methods of food preservation; name several diseases caused by bacteria; discuss the role of bacteria in the environment.

SC-BI-09-03 - Identify Concepts of Medical Microbiology (Objective)

S - Supporting

The students will be able to list the steps of Koch's Postulates; list the ways that infectious

diseases are transmitted; explain the body's lines of defense against infectious diseases; describe the various types of immunity; discuss the antigen-antibody reaction; prepare bacteria slides for observation under the microscope.

SC-BI-09-04 - Distinguish Between a Virus and a Bacterium (Objective)

S - Supporting

The students will identify methods of reproduction of the virus and the bacteria; compare colonial growth with viral growth; describe the chemical make-up of viruses compared to bacteria; describe eukaryotic and prokaryotic cells.

SC-BI-10 INVERTEBRATES AND VERTEBRATES (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of invertebrates and vertebrates by identifying the levels of structure within an organism and by identifying the five different classes of vertebrates.

SC-BI-10-01 - Animal Anatomy and Physiology (Objective)

S - Supporting

The students will be able to list the different systems and describe the functions of the ten organ systems of living things--reproduction, muscular, nervous, respiratory circulatory, skeletal, endocrine, integumentary, excretory, and digestive systems; describe the levels of organization of living things as cell, tissue, organs, organ systems.

SC-BI-10-02 - Identify the Phyla of the Invertebrates (Objective)

S - Supporting

The students will be able to list the major characteristics of these animal phyla: Porifera, Coelenterata, Platyhelminthes, Nematoda, Annelida, Mollusca, Echinodermata, Arthropoda and Chordata; describe the life cycle of a parasitic worm; discuss metamorphosis of insects; dissect an earthworm and demonstrate a knowledge of its anatomy and physiology.

SC-BI-10-03 - Identify the Phyla of the Vertebrates (Objective)

S - Supporting

The students will be introduced to a frog's anatomy and physiology; dissect a fetal pig and demonstrate a knowledge of its anatomy and physiology; identify the advancements of the different classes of vertebrates with respect to reproduction, care of their young, skeleton, circulatory system, respiration, and the nervous system; digestive, muscular, skeletal, nervous, excretory, lymphatic, circulatory, integumentary, endocrine, and reproductive systems.

SC-BI-10-04 - Identify Animals in the Five Classes of Vertebrae (Objective)

S - Supporting

The students will identify characteristics of each class and be able to give examples of each class.

SC-BI-11 CLASSIFICATION OF PLANTS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of plants by describing the functions of the plant organs.

SC-BI-11-01 - Identify the Structure of Non-vascular Plants (Objective)

S - Supporting

The students will be able to identify the structure of molds, fungus and algae; determine the methods of reproduction of non-seed plants; classify non-seed plants by structure.

SC-BI-11-02 - Identify the Structure of Vascular Plants (Objective)

S - Supporting

The students will be able to classify types of seed plants as gymnosperms or angiosperms, monocots or dicots; identify annuals, perennials, and biennials; identify internal and external structures of a plant's root, stem, leaves, and flowers; describe color-change and leaf-loss in plants.

SC-BI-11-03 - Plant Anatomy and Physiology (Objective)

S - Supporting

The students will describe the function of these major plant organs--stems, roots, leaves, and flower; describe the process of photosynthesis as green plants combining carbon dioxide, water and sunlight to produce glucose and oxygen; describe the process of transpiration.

SC-BI-11-04 - Describe Plant Responses to Stimuli (Objective)

S - Supporting

The students will describe how plants respond to gravity, sunlight, water, and touch; define tropism.

last update 6/24/2009

pc

Campbell County School District # 1
Gillette, Wyoming

Science - Chemistry

CCHS - General Chemistry is a year-long course designed for college-bound students with a strong interest in Science and a proven understanding of mathematical concepts. Laboratory work is used to supplement the ideas that are learned in lectures. Computers are used to reinforce the chemistry and mathematical concepts that are learned. A scientific calculator and good attendance are required.

Prerequisites: Do not enroll in General Chemistry if you are not currently enrolled in or have not passed Algebra I.

WJSH - Chemistry introduces problem solving with emphasis on dimensional analysis applied to chemical topics. During the first quarter, emphasis is placed on classification of matter, nomenclature, the periodic table, formula writing, and the concept of moles. The second quarter deals with atomic structure, gases, kinetic theory, chemical equations, acids and bases, and stoichiometry.

Textbook: Chemistry - Holt, 2004

SC-CH-01 HISTORICAL DEVELOPMENT OF CHEMISTRY (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings (*taught, not tested*)

SC11.2.2 Use Inquiry to Conduct Scientific Investigations (*taught, not tested*)

SC11.2.3 Communicate the Result of Scientific Inquiry (*taught, not tested*)

SC11.2.4 Role of Science/Technology in Meeting Human Needs (*taught, not tested*)

SC11.2.5 Use Equipment Safely, Observe Safety Procedures (*taught, not tested*)

Students will demonstrate an ability to use the scientific method to solve a problem.

SC-CH-01-01 - Origins of Chemistry - Alchemy vs Chemistry (Objective)

S - Supporting

Students will contrast alchemy to chemistry.

SC-CH-01-02 - Apply Steps in Scientific Method to Solve Problem (Objective)

S - Supporting

The students will apply steps in the scientific method to the solution of a personal problem, such as one involving the home, school, friends, or finances.

SC-CH-02 MEASUREMENT (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of the metric system and an ability to convert between units of mass, length, and volume using dimensional analysis.

SC-CH-02-01 - Metric System Units of Length, Volume, and Mass (Objective)

S - Supporting

The students will name the metric units of length, volume, and mass.

SC-CH-02-02 - Convert From English Unit to Metric Unit (Objective)

S - Supporting

The students will convert from an English unit to the corresponding metric unit using dimensional analysis, when given conversion factors.

SC-CH-02-03 - Convert Units of Mass, Length, and Volume (Objective)

S - Supporting

The students will convert units of mass, length, and volume using dimensional analysis.

SC-CH-02-04 - Density: Calculate 3rd Value - Mass/Density/Volume (Objective)

S - Supporting

The students will calculate the third value when given any of the following: mass, density, and volume.

SC-CH-02-05 - Temperature: Celsius to Fahrenheit and Vice Versa (Objective)

S - Supporting

The students will convert temperatures from Celsius to the Fahrenheit scale and vice versa.

SC-CH-02-06 - Temperature: Celsius to Kelvin and Vice Versa (Objective)

S - Supporting

The students will change degrees Celsius to degrees Kelvin and vice versa.

SC-CH-02-07 - Write Numbers in Scientific Notation (Objective)

S - Supporting

The students will write numbers in scientific notation.

SC-CH-03 MATTER AND ITS CHANGES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

Students will distinguish between states and types of matter, and between physical and chemical properties and changes. Students will distinguish between states and types of matter, and between physical and chemical properties and changes.

SC-CH-03-01 - Distinguish Between Types and Changes of Matter (Objective)

C - Critical--Assessment Reporting Required

The students will be able to distinguish between an atom and a molecule, and between an element and a compound. Students will distinguish between states and types of matter, and between physical and chemical properties and changes.

SC-CH-04 ATOMIC STRUCTURE (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will describe the make up of a molecule and the properties of subatomic particles. Students will demonstrate an ability to distinguish between the subatomic particles: proton, electron, and neutron.

SC-CH-04-01 - Subatomic Particles: Protons, Electrons, Neutrons (Objective)

C - Critical--Assessment Reporting Required

The students will understand the relationship between protons, neutrons, electrons, and the structure of the atom.

SC-CH-04-02 - Explain Relationship--Mole & Avogadro's Number (Objective)

S - Supporting

The students will calculate the quantities in moles and their relationships between grams and atoms.

SC-CH-05 EQUATIONS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will demonstrate a basic knowledge of the products of a chemical reaction, and they will use that reaction to calculate percent of yield.

SC-CH-05-01 - Predict the Products for Chemical Reactions (Objective)

C - Critical--Assessment Reporting Required

The students will be able to predict the products for the different types of chemical reactions.

SC-CH-05-02 - Stoichiometry: Theoretical, Experimental, % Yield (Objective)

C - Critical--Assessment Reporting Required

The students will be able to quantify the products, reactants, and percent yield for a chemical reaction.

SC-CH-06 SOLUTIONS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of the concept of molarity and moles by solving for molarity, moles, and volume.

SC-CH-06-01 - Calculate Molarity, Number of Moles, or Volume (Objective)

S - Supporting

The students will calculate molarity, number of moles, or volume.

SC-CH-07 GASES (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of the nature of gases by using the combined gas law to predict changes in temperature, pressure, and volume.

SC-CH-07-01 - Use Combined Gas Law to Calculate Changes (Objective)

S - Supporting

The students will use the combined gas law to calculate changes.

SC-CH-08 LAB SAFETY (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will follow lab safety procedures.

SC-CH-08-01 - Lab Safety Awareness and Practices (Objective)

C - Critical--Assessment Reporting Required

The students will understand the hazards present in the chemistry laboratory and will follow lab safety procedures.

Campbell County School District # 1
Gillette, Wyoming

SCIENCE
ECOLOGY (at CCHS and WJSHS)

CCHS - Ecology is the study of how living things (plants and animals) relate to their environment or surroundings. We will look at the relationships between the living and nonliving worlds and how they interact to form a stable ecosystem. At the end of each semester, a week-long field trip to Jackson, Wyoming, will be taken. Field trip participation is limited to those students who meet the specific criteria: academic performance, science preparation, attendance, class participation, and attitude.

Prerequisite: Above average grade in another science course

WJSH - During the first quarter of this class, students will study ecosystems and their characteristics and the biomes of the Earth.

In the second quarter, students will study pollution, environmental problem solving, water pollution, preserving biodiversity, and energy and weather.

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-EG-01 WYOMING LANDSCAPES AND HABITATS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

Students will identify the major mountain ranges, rivers, and basins of Wyoming and will demonstrate an understanding of how the physical landscape of the State determines the biological landscape of the State.

SC-EG-01-01 - Wyoming's Physical Landscape (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify the major mountain ranges, rivers, and basins of Wyoming.

SC-EG-01-02 - Wyoming Weather and Climate (Objective)

C-NR - Critical-District Reporting Not Required

The students will explain the wide range of temperature and precipitation levels across Wyoming in terms of air masses, elevational differences, adiabatic cooling, and aspect.

SC-EG-01-03 - Wyoming Habitat Types (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify Wyoming's major habitat types and explain, in terms of temperature and precipitation, why each habitat type occurs where it does. Students will recognize major plant and animal "indicator species" of each habitat type.

SC-EG-01-04 - Landscape and Habitat Culminations (Objective)

C- Critical - Assessment Reporting Required

The students will design their own state, influenced by the same air masses as Wyoming at the same times of year. Students will place landforms within their state and report on the climactic conditions, habitat types, and animals that they would expect to see throughout the state.

SC-EG-02 EVOLUTION AND ADAPTATION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.3 Biological Evolution

SC11.1.6 Behavior and Adaptation

Students will identify adaptations as traits or behaviors that enhance an organism's chance for survival and reproductive success, classify adaptations, and describe the process by which adaptations arise.

SC-EG-02-01 - Adaptations (Objective)

C-NR - Critical-District Reporting Not Required

The students will define "adaptation," explore the diversity of adaptations in the plant and animal world, and classify adaptations into six categories:

- physiological
- behavioral
- morphological
- food-getting
- mating
- defense.

SC-EG-02-02 - Natural Selection (Objective)

C- Critical - Assessment Reporting Required

The students will explain the process of natural selection.

SC-EG-02-03 - Adaptation Culmination (Objective)

C- Critical - Assessment Reporting Required

The students will design an organism suited to one of Wyoming's habitat types and write a species account, listing and justifying its adaptations to the abiotic and biotic environments.

SC-EG-03 POPULATION AND COMMUNITY ECOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.3 Biological Evolution

SC11.1.6 Behavior and Adaptation

Students will understand and apply the major principles of population and community ecology.

SC-EG-03-01 - Populations (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate factors that influence populations and distinguish between logistic and exponential growth..

SC-EG-03-02 - Community Ecology (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify and describe the major interspecies interactions (predation, competition, mutualism, commensalisms, parasitism) and will demonstrate understanding of the principles of competitive exclusion and resource partitioning.

SC-EG-04 ECOSYSTEM ECOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.1.13 Energy and Matter

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will describe energy and nutrient flow in ecosystems and describe food web interrelationships.

SC-EG-04-01 - Flow of Energy and Materials (Objective)

C-NR - Critical-District Reporting Not Required

The students will compare and contrast the flows of energy and materials in an ecosystem. They will explain the need of living organisms/systems for a continuous input of energy, and they will describe how this is accomplished. Students will identify trophic levels and they will explain the roles of photosynthesis and respiration in the flows of energy and materials.

SC-EG-04-02 - Ecosystem Relationships (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe organisms' role in ecosystems and investigate potential results of ecosystem disturbance (e.g., species extinction/introduction, persistent toxin introduction).

SC-EG-04-03 - Ecosystem Culmination (Objective)

C- Critical - Assessment Reporting Not Required

The students will design an ecosystem consisting of existing or hypothetical organisms and will prepare a report that demonstrates understanding and application of the previous two objectives.

SC-EG-04 PUBLIC LANDS / WYOMING ISSUES (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will demonstrate a knowledge of the origins of public lands, their dispersal, mandates that created various types of public lands (parks, forests, and wilderness) and acceptable uses of public lands. Students will investigate current public land or wildlife issues in Wyoming.

SC-EG-05-01 - Parks, Forests, and Wilderness (Objective)

C-NR - Critical-District Reporting Not Required

The students will distinguish between National Parks, National Forests, and Wilderness with respect to:

- origins of public lands
- dispersal of public lands
- the mandates that created parks, forests, and wilderness areas
- uses of these types of lands (can do's and cannot do's)

SC-EG-05-02 - Public Lands and Wildlife Issues (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate current public land or wildlife issues in Wyoming and report their findings.

last update 6/23/2009

pc

Campbell County School District # 1
Gillette, Wyoming

Science
Environmental Chemistry (CCHS)

CCHS - Environmental Chemistry is designed for students who have an interest in chemistry from an environmental standpoint; it is not a college preparatory class. This is a more practical approach to relate the concepts of chemistry to the environment, resources, and conservation both locally and globally.

Prerequisite: Average grade in preceding science, and pass Algebra I. (Do not enroll in Environmental Chemistry if you have passed General Chemistry).

Textbook: Chemistry in the Community - CHEMcom - W. H. Fraser & Co. - 2002

SC-EN-01 SUPPLYING OUR WATER NEEDS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.1.7 Geochemical Cycles

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

SC11.2.1 Research Scientific Info; Present Findings

SC11.3.2 Examine Use of Scientific Info for Decision-Making (*taught, not tested*)

Students will demonstrate an understanding of the physical and chemical properties of water, its involvement in life processes, and treatments of water.

SC-EN-01-01 - Properties of Water and Aqueous Mixtures (Objective)

CS - Critical-Assessment at Content Standard

The students will demonstrate an understanding of the properties of water and aqueous mixtures and obtaining adequate supplies of water pure enough for our needs.

ASSESSMENT STANDARDS: The student's demonstration may be in the form of an interview, written report, objective assessment, lab activity, or other comparable means.

SC-EN-01-02 - Measurements, Formulas, Acids, Bases, pH, etc. (Objective)

S - Supporting

The students will demonstrate knowledge of concepts related to measurement, formulas, nomenclatures, acids, bases, pH, and pollution.

SC-EN-02 CONSERVING CHEMICAL RESOURCES (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

Students will demonstrate an understanding of resources by knowing the following:

1) Uses of resources

2) Why we use what we do

3) Conservation in Nature and the community

Students will understand and be able to use the periodic table and successfully write chemical equations.

SC-EN-02-01 - Behavior/Properties of Matter (Objective)

C-CS - Critical-Assessment at Content Standard

The students will demonstrate an understanding of the properties and behavior of matter, and he will define and give examples of renewable and nonrenewable resources.

ASSESSMENT STANDARDS: The student's demonstration may be in the form of an interview, laboratory activity, objective assessment, or other comparable means.

SC-EN-02-02 - Conservation Strategies (Objective)

C-CS - Critical-Assessment at Content Standard

The students will investigate resource conservation strategies required to maintain a high standard of living (use/reuse, recycling, substitution, or a combination of these methods).

ASSESSMENT STANDARDS: The students will investigate through library research, on-line data searches (PSINET), or other methods. The investigation will be assessed by a written report, oral presentation, interview, or other comparable means.

SC-EN-02-03 - Chemical Concepts (Objective)

S - Supporting

The students will become familiar with chemical concepts including equation balancing, properties and reactivities of metals, the periodic table, and the mole concept.

SC-EN-03 PETROLEUM: TO BUILD? TO BURN? (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.13 Interactions of Energy and Matter

SC11.3.2 Examine Use of Scientific Info for Decision-Making (*taught, not tested*)

Students will demonstrate an understanding of Petroleum, how we use it both to build with and to burn, and the chemical structure and nomenclature of the components of petroleum.

SC-EN-03-01 - Petroleum Products, Petrochemicals, Politics (Objective)

C-CS - Critical-Assessment at Content Standard

The students will be able to relate petroleum products to their resource, describe the importance of petrochemicals, understand that the Earth's supply of petroleum is finite, and explain the impact of petroleum on foreign policy.

ASSESSMENT STANDARDS: The student's demonstration may be in the form or oral presentation, interview, written report, lab activity, objective assessment, or other comparable means.

SC-EN-03-02 - Organic Chemistry, Sources of Energy, Etc. (Objective)

S - Supporting

The students will investigate alternate energy sources, and they will demonstrate a knowledge of and ability to use the following concepts:

- Organic chemistry
- Naming
- Properties
- Covalent bonding
- Hydrocarbon isomers
- Petrochemical synthesis
- Combustion
- Polymerization

SC-EN-04 UNDERSTANDING FOODS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

- SC11.1.4 Interdependence of Organisms
- SC11.1.5 Matter, Energy, Organization in Living Systems
- SC11.1.10 Structure and Properties of Matter
- SC11.1.12 Conservation of Energy and Increase to Disorder
- SC11.3.1 Examine Use of Scientific Info for Decision-Making

The students will demonstrate an understanding of the following concepts of foods:

- Food as energy
- Other substances in food
- Food as builder molecules
- Chemistry of nutrition

SC-EN-04-01 - Food Energy (Objective)

C-CS - Critical-Assessment at Content Standard

The students will analyze the use of food for energy and structure, and he will demonstrate an understanding of food as our most renewable resource. The students will compare global hunger and personal nutrition.

ASSESSMENT STANDARDS: The student's analysis will be demonstrated by oral presentation, interview, written report, objective assessment, or other comparable means.

SC-EN-04-02 - Chemical Structure-Carbohydrates/Fats/Proteins (Objective)

C-CS - Critical-Assessment at Content Standard

The students will demonstrate an understanding of the chemical structure of carbohydrates, fats, and proteins.

ASSESSMENT STANDARDS: The student's demonstration may be in the form of written report, objective assessment, or other comparable means.

SC-EN-04-03 - Vitamins & Minerals; Risks of Food Additives (Objective)

S - Supporting

The students will identify vitamins and minerals used in the body, and they will determine the relative risks of food additives.

SC-EN-05 - NUCLEAR CHEMISTRY IN OUR WORLD (Content Standard)

State Standard and Benchmark Correlation:

none

Students will have a basic understanding of the role of nuclear chemistry in our world.

SC-EN-05-01 - Nuclear Science and Technology--Risks/Benefits (Objective)

S - Supporting

The students will demonstrate an understanding of the basic facts related to nuclear science and technology, and they will know the risks and benefits of nuclear technology.

SC-EN-05-02 - History and Development of Nuclear Energy (Objective)

S - Supporting

The students will become familiar with the history and development of nuclear energy, modern day reactors, and fusion.

SC-EN-05-03 - Isotopes, Radon Gas, Fusion, etc. (Objective)

S - Supporting

The students will be able to interpret information regarding:

- Isotopes
- Radiation detectors shielding
- Fusion
- Radon gas
- Biological radiation damage

SC-EN-05-04 - Nuclear Waste and Disposal (Objective)

S - Supporting

The students will analyze problems and solutions related to nuclear waste generation and disposal.

SC-EN-06 CHEMISTRY, AIR, AND CLIMATE (Content Standard)

State Standard and Benchmark Correlation:

none

Students will understand the basic chemistry of our atmosphere.

SC-EN-06-01 - The Atmosphere as a Major Resource (Objective)

S - Supporting

The students will identify the atmosphere as a major resource and be able to describe the major components of the atmosphere.

SC-EN-06-02 - Global Warming, Ozone, Smog (Objective)

S - Supporting

The students will explore the issues of global warming, ozone, and smog.

SC-EN-06-03 - Physical Properties of Gasses (Objective)

S - Supporting

The students will describe the physical properties of gasses and the effects that volume, temperature, and pressure have on gasses.

SC-EN-07 HEALTH: YOUR RISKS AND CHOICES (Content Standard)

State Standard and Benchmark Correlation:

none

Students will understand the functions of chemistry as related to health.

SC-EN-07-01 - Chemistry and Good Health (Objective)

S - Supporting

The students will analyze chemical reasons for good health, methods of maintaining good health, and methods for making informed personal choices.

SC-EN-07-02 - Elements of the Human Body (Objective)

S - Supporting

The students will describe the major elements contained in the human body and therefore how chemicals contribute to growth and maintaining health.

SC-EN-07-03 - Chemical Effects on the Human Body (Objective)

S - Supporting

The students will examine the chemical effects of soaps, common drugs, smoke, sunlight, and diseases on the body.

SC-EN-08 THE CHEMICAL INDUSTRY (Content Standard)

State Standard and Benchmark Correlation:

none

Students will understand the role of the chemicals industry in our society.

SC-EN-08-01 - Positive/Negative Effects of Chemical Industry (Objective)

S - Supporting

The students will describe the positive and negative effects of the chemical industry on his life and the environment. They will analyze the responsibility of the individual in an industry/society partnership.

SC-EN-08-02 - Chemical Processes and the Community (Objective)

S - Supporting

The students will study fertilizers, explosives, electroplating, and synthetic products; they will examine a typical chemical factory and its risks and benefits to the community.

**Campbell County School District #1
Gillette, Wyoming**

**SCIENCE
ENVIRONMENTAL SCIENCE/ECOSYSTEMS**

Westwood High School & WJSHS

SC-EV-01 ECOSYSTEMS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

Students will identify the characteristics of an ecosystem.

SC-EV-01-01 - Characteristics of an Ecosystem (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify the characteristics of an ecosystem, with emphasis on the importance of biotic and abiotic factors.

SC-EV-01-02 - Parts of an Ecosystem (Objective)

S - Supporting

The students will understand the parts of an ecosystem including niche, communities, and populations.

SC-EV-01-03 - Species Interactions (Objective)

S - Supporting

The students will identify major types of species interactions, including predation, competition, and symbiotic relationships.

SC-EV-02 FOOD CHAINS AND FOOD WEBS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.3 Biological Evolution

Students will describe the roles of organisms in food chains and food webs.

SC-EV-02-01 - Organisms in a Food Chain/Food Web (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the role of producers, consumers, and decomposers in food chains and food webs.

SC-EV-02-02 - Water, Carbon, and Nitrogen Cycle (Objective)

S - Supporting

The student will identify how the water, carbon, and nitrogen cycle is important in the activities of living organisms.

SC-EV-03 BIOMES OF THE EARTH (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.3 Biological Evolution

Students will identify biomes of the earth.

SC-EV-03-01 - Distinguishing Factors of Major Biomes (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the main factors that distinguish the major biomes of the earth.

SC-EV-03-02 - Adaptations (Objective)

S - Supporting

The students will compare the adaptations of organisms which allow these organisms to survive in each biome.

SC-EV-04 ENVIRONMENTAL PROBLEM SOLVING (Content Standard)

State Standard and Benchmark Correlation:

SC11.1-02 Molecular Basis of Heredity

SC11.1-03 Biological Evolution

SC11.3-02 Examine Use of Scientific Info for Decision-Making

The students will demonstrate the use of scientific inquiry.

SC-EV-04-01 - Scientific Inquiry (Objective)

C-NR - Critical-District Reporting Not Required

Students will demonstrate how scientific inquiry can be used to solve environmental problems.

SC-EV-04-02 - Scientific Tools (Objective)

S - Supporting

Students will describe the tools used by scientists to learn about the natural world and to solve practical problems such as how to protect the environment.

SC-EV-05 AIR POLLUTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.3.2 Examine Use of Scientific Info for Decision-Making

The students will identify the major causes of air pollution and related problems.

SC-EV-05-01 - Causes/Effects of Acid Precipitation (Objective)

C-NR - Critical-District Reporting Not Required

Students will identify the causes of acid precipitation and its effects on our ecosystem.

SC-EV-05-02 - Global Warming (Objective)

S - Supporting

Students will explain why many scientists predict that human activity will cause the earth's climate to become warmer.

SC-EV-06 WATER POLLUTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.3.2 Examine Use of Scientific Info for Decision-Making

The students will describe the impact of water pollution.

SC-EV-06-01 - Causes/Effects of Water Pollution (Objective)

C-NR - Critical-District Reporting Not Required

Students will describe the impact of water pollution on people and the environment.

SC-EV-06-02 - Fresh Water as a Resource (Objective)

S - Supporting

Students will explain why fresh water is a precious resource.

SC-EV-07 PRESERVING BIODIVERSITY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.3.2 Examine Use of Scientific Info for Decision-Making

The students will identify and explain the importance preserving biodiversity.

SC-EV-07-01 - Preserving Biodiversity (Objective)

C-NR - Critical-District Reporting Not Required

Students will identify the importance of preserving biodiversity.

SC-EV-07-02 - Effects of Civilization on Animal Species (Objective)

S - Supporting

Students will identify how humans are causing the extinction of other species.

SC-EV-08 ENERGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

SC11.3.2 Examine Use of Scientific Info for Decision-Making

The students will identify the energy resources on this earth.

SC-EV-08-01 - Renewable vs. Non-Renewable Energy Resources (Objective)

C-NR - Critical-District Reporting Not Required

Students will be able to distinguish between renewable and non-renewable energy resources.

SC-EV-08-02 - Alternative Energy Sources (Objective)

S - Supporting

Students will describe several alternative energy sources and why these options have advantages and disadvantages.

SC-EV-08-03 - Methods of Energy Conservation (Objective)

S - Supporting

Students will describe methods of energy conservation.

last update 6/24/2009

pc

Campbell County School District # 1
Gillette, Wyoming

Science - General Earth Science

CCHS - This course is an introduction to Earth Science. The primary concepts in this course will emphasize mapping, hydrology, and meteorology. Students will be expected to collect and manipulate long-term meteorological data.

Prerequisite: Average grade in preceding science courses

WJSH -Earth Science is a course that emphasizes the study of the earth and its systems. Students will identify rocks and minerals and surface processes. They will describe the theory of plate tectonics and profile the ocean floor.

This course has components that include Earth's history, astronomy, and meteorology. Scientific technology and data collection will be major tools.

Textbook: Earth Science - McDougal - 2005

SC-GE-01 EARTH SCIENCE METHODS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will use different types of maps – physiographic, topographic, and shaded relief -- to measure distance, elevation, slope, and direction; to calculate bearings; and to identify land forms such as hills, ridges, depressions, and cliffs.

SC-GE-01-01 - Use of a Topographical Map (Objective)

C-NR - Critical-District Reporting Not Required

Using a topographical map, the students will determine latitude and longitude; townships, ranges, sections, and quarters of land; distance, elevation, and direction; and they will identify land forms such as hills, ridges, depressions, and cliffs.

SC-GE-01-02 - Data Interpretation (Objective)

C-NR - Critical-District Reporting Not Required

The students will demonstrate their ability to read line, pie, and bar graphs.

SC-GE-02 METEOROLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

The students will describe the Earth as a closed system and demonstrate a conceptual understanding of the hydrosphere and atmosphere. Students will investigate and explain the role of energy in each of these systems and how it relates to weather patterns.

SC-GE-02-01 - Meteorological Data to Predict Weather (Objective)

C - Critical--Assessment Reporting Required *DSPA #1*

The students will collect and analyze meteorological data to understand the relationship between the various forces which cause weather.

SC-GE-02-02 - Use of Meteorologic Data to Predict Weather (Objective)

C - Critical--Assessment Reporting Required *DSPA #2*

Students will use meteorological data, tools and maps to interpret current and future weather phenomena. These include:

- isobar maps to determine wind speed, direction and areas of high and low pressure systems.
- isotherm maps to determine temperature trends
- meteorological instruments: Thermometer, Sling Psychrometer and Barometer
- satellite imagery, visible, infrared and radar to forecast areas of precipitation

SC-GE-03 BIOGEOCHEMICAL CYCLES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.1.7 Geochemical Cycles

SC11.1.10 Structure and Properties of Matter

Students will develop an understanding of the dependency and relationships of living systems have with one another and also with their hydrological and geological environment.

SC-GE-03-01 - Structure and Property of Matter (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the subatomic structure of matter, its properties, and chemical interactions. Students will recognize that the organization of the periodic table is based on the outermost electrons of the elements and that these groups have similar properties.

SC-GE-03-02 - Matter, Energy, Organization in Living Systems (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the reliance of living systems for a continuous input of energy to maintain stability. Students will explain the unidirectional flow of energy and organic matter through a series of trophic levels in living systems.

SC-GE-03-03 - Interdependence of Organisms (Objective)

C-NR - Critical-District Reporting Not Required

Students will investigate the interrelationships and interdependence of organisms.

SC-GE-03-04 - Geochemical Cycles (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the earth as a closed system and will understand the interdependence of the biosphere, hydrosphere, and geosphere with regard to the basic materials and cycles of water, rock, nitrogen, carbon, and oxygen.

SC-GE-03-05 - Biogeochemical Cycles Culmination (Objective)

C - Critical--Assessment Reporting Required *DSPA #3*

Students will demonstrate their understanding of the interdependence and relationships of the biosphere, hydrosphere, and geospheres.

**Campbell County School District #1
Gillette, Wyoming**

**SCIENCE
HUMAN PHYSIOLOGY (CCHS)**

Human Physiology is the study of the human body structure and functions. This class is designed to give the student an appreciation of the complexity of the human body and to learn the basic anatomy and physiology of some major body systems. Laboratory work is used to reinforce many concepts, and this work will include dissection.

Prerequisite: Above-average grade in Biology

Textbook: Structure and Function of the Body - Mosby, 2004

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-HP-01 INTRODUCTION TO ANATOMY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will describe the levels of biological organization, understand anatomical terms related to position and body region and will explain general principles of biochemistry.

SC-HP-01-01 – Levels of Organization (Objective)

C-NR - Critical-District Reporting Not Required

Students will identify the levels of organization within the human body, from atom to organ system.

SC-HP-01-02 – Anatomical Position/Region/Direction (Objective)

C – NR – Critical-District Reporting Not Required

Students will utilize the systems and terminology of anatomical orientation and direction to locate and identify body parts.

SC-HP-01-03 – General Biochemistry (Objective)

C- NR – Critical-District Reporting Not Required

Students will describe and understand atoms, molecules, and macromolecules and their roles in human systems.

SC-HP-02 CELLS, TISSUES, AND ORGAN SYSTEMS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe cellular structure and function, tissues and their function, and identify major organ systems.

SC-HP-02-01 – Cell Structure and Function (Objective)

C-NR - Critical-District Reporting Not Required

Students will identify cell organelles and their function and demonstrate an understanding of major cell processes.

SC-HP-02-02 – Tissues and Organ Systems (Objective)

C-NR - Critical-District Reporting Not Required

Students will describe various tissue types and their function and identify the major organ system.

SC-HP-03 NERVOUS SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will understand the nervous system through knowledge of its components and their function and through involvement in life experiences.

SC-HP-03-01 – Nervous System Components and Functions (Objective)

C-NR - Critical-District Reporting Not Required

Students will understand how the neurons, spinal cord, nerves, and brain function together in an everyday life experience. Students will understand how the nervous system is involved in life experiences.

SC-HP-03-02 – Identify Parts of Neuron, Spinal Cord, Brain (Objective)

S - Supporting

Students will investigate the anatomy of the heart and will understand the functions of arteries, veins, and capillaries.

SC-HP-03-03 - What Makes the Heart Beat (Objective)

S - Supporting

The students will investigate and understand what makes the heart beat.

last update 6/24/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Introduction to Geology
(one semester)

This course is a basic introduction to Geology. The concepts covered will include the composition of earth materials and the processes that have shaped the earth's surface.

Prerequisite: Average grade in preceding science courses

Textbook: Earth Science - McDougal-Littel, 2005

SC-IG-01 EARTH MATERIALS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.8 Origin and Evolution of the Earth System

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

Using rock and mineral identification and classification as the geologic objective, students will develop an understanding of the complexity and physical attributes of minerals.

SC-IG-01-01 Structure and Properties of Matter (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the structure of matter, its properties, and chemical interactions. Students will recognize that the organization of the periodic table is based on the elements outermost electrons and that these groups have similar properties.

SC-IG-01-02 - Chemical Reactions (Objective)

C-NR - Critical-District Reporting Not Required

The students will realize that chemical reactions take place constantly; that the type of reaction is dependent on the elements involved; and that chemical reactions can occur at different rates and result in the formation of different substances which have unique physical properties.

SC-IG-01-03 - Use of Key to Identify Minerals and Mineral Properties and Rocks and Rock Formation (Objective)

C - Critical--Assessment Reporting Required *DSPA #1*

Students will demonstrate an ability to conduct simple tests to identify common minerals and rocks, research their chemical formulas, and relate their chemical nature to an outstanding property. The simple tests and classification schemes include:

- Identifying crystal shape, hardness, streak, cleavage, luster, specific gravity, color diaphaneity, fracture, reaction to acid, fluorescence, double refraction, and magnetism.
- Determining the classifications of rock-forming mineral groups into silicates, carbonates, iron oxides, and iron sulfides.
- Determining the methods and types of rock formation.

SC-IG-01-04 - Identify Basic Soil Types (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify basic soil types based on particle size and organic content.

SC-IG-02 SURFACE PROCESSES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

SC11.1.8 Origin and Evolution of the Earth System

Students will analyze and interpret the factors which cause changes to the earth's surfaces. They will explain the forces that cause weathering, erosion, deposition, and plate tectonics; they will describe the effects of these processes on the earth's surface.

SC-IG-02-01 - Lithospheric Plates and Tectonic Activities (Objective)

C - Critical--Assessment Reporting Required *DSPA #2*

The students will identify the major Lithosphere plates and the tectonic activities associated with their boundaries.

SC-IG-02-02 - Factors Which Change the Earth's Surface (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify agents which cause erosion, weathering, deposition, and tectonic plate movements.

SC-IG-03 EARTH HISTORY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.8 Origin and Evolution of the Earth System

Students will utilize physical evidence to investigate earth history. They will use fossil keys to identify locally abundant fossils and rock strata to develop an understanding of earth's history.

SC-IG-03-01 - Using Fossil Keys to Identify Fossils, Rock Strata (Objective)

C-NR - Critical-District Reporting Not Required

The students will use fossil keys to identify locally abundant fossils, rock strata, and the periods of earth history they represent.

SC-IG-03-02 - Use Geological Map Data to Identify Local Strata (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify local strata based on the period and conditions which caused their deposition. This will be based on geological map data.

last update 6/24/2009

pc

**Campbell County School District #1
Gillette, Wyoming**

Science - Advanced Geology

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-JG-01 HISTORY OF GEOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.3.1 Examine Nature and History of Science

Students will study the history and development of geologic theory.

SC-JG-01-01 - Geologic Theory (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate major historic developments leading to our current understanding of geology.

SC-JG-02 EARTH MATERIALS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

SC11.1.10 Structure and Properties of Matter

Students will investigate the chemical and physical properties of common rocks and minerals. Properties are then related to human uses of these natural resources.

SC-JG-02-01 - Chemical and Physical Properties of Rocks/Minerals (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate and understand the chemical and physical properties of common rocks and minerals.

SC-JG-02-02 - Human Use of Natural Resources (Objective)

C-NR - Critical-District Reporting Not Required

The students will relate properties of common rocks and minerals to their value and use by humans.

SC-JG-03 EARTH RESOURCES AND MAPS (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.2.4 Role of Science/Technology in Meeting Human Needs

Students will investigate and apply mineral location, extraction, processing, and materials testing techniques.

SC-JG-03-01 - Identifying and Locating Earth Resources (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate organization techniques in the form of maps, charts, and stratigraphic columns in order to identify and locate earth resources. These topics will be addressed from mining perspective.

SC-JG-03-02 - Plaster of Paris Project (Objective)

C-NR - Critical-District Reporting Not Required

The students will mine and process Gypsum to produce “plaster of Paris.” Materials testing through inquiry will lead to publication and synthesis of data used in the construction of a cast plaster beam.

SC-JG-04 PLATE TECTONICS AND STRUCTURAL GEOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.8 Origin and Evolution of the Earth System

SC11.1.9 Origin and Evolution of the Universe

Students will explore and investigate the dynamics and history of the earth.

SC-JG-04-01 - Physical History of Earth; Plate Tectonics (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate the physical history of earth from the formation of the solar system through the current causes and effects of plate tectonics.

SC-JG-05 GEOLOGIC HISTORY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.8 Origin and Evolution of the Earth System

Students will investigate earth’s history through geologic evidence.

SC-JG-05-01 - Earth's Historic Environment; Fossil Records (Objective)

C-NR - Critical-District Reporting Not Required

The students will investigate the 4.6 billion-year fossil record of our planet and will use geologic principles to deduce historic environments on our planet.

**Campbell County School District #1
Gillette, Wyoming**

SCIENCE - ORGANIC CHEMISTRY (CCHS)

Organic Chemistry is a laboratory science concerned with the study of carbon-containing compounds and their derivatives. It is based on the study of functional groups and their relation and reaction to other such groups. Whenever practical, the relationship of organic compounds to everyday products and life are demonstrated. Emphasis will be on nomenclature and structural chemistry.

Prerequisite: Average grade in General Chemistry

Textbook: Organic Chemistry, a Brief Course - Heath, 1983

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-OC-01 IDENTIFY/WRITE FORMULAS-GROUPS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will demonstrate an ability to identify and recognize functional groups.

SC-OC-01-01 - Recognize the Functional Groups (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify and write formulas for alkanes, alkenes, alkynes, alcohols, ketones, aldehydes, esters, carboxylic acids, and amines.

SC-OC-02 FORMULAS/IUPAC NAMES-COMPOUNDS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will demonstrate an ability to draw formulas from IUPAC formula names and vice versa.

SC-OC-02-01 - Write Names From Formulas, Formulas From Names (Objective)

C-NR - Critical-District Reporting Not Required

The students will state the formulas and IUPAC names for alkanes, alkenes, alkynes, alcohols, ketones, aldehydes, esters, carboxylic acids, and amines.

SC-OC-03 WRITE EQUATIONS/ORGANIC REACTIONS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.11 Chemical Reactions

Students will demonstrate an ability to describe products and steps in forming compounds.

SC-OC-03-01 - Describe Products/Steps in Forming Compounds (Objective)

C-NR - Critical-District Reporting Not Required

The students will write equations that express the formation of alkanes, alkenes, alkynes, alcohols, ketones, aldehydes, esters, carboxylic acids, and amines.

last update 6/24/2009

pc

Campbell County School District # 1
Gillette, Wyoming

Physical Science / Chemistry
(1 Semester)

This is an introductory course into the field of Chemistry. The focus of the course is to provide solid scientific foundation into chemical science concepts. Both lab and math work will accompany the course with care not to discriminate against students with border-line math skills. This course should serve as a stepping stone for students who wish to proceed into more difficult chemistry courses. The course will include the study of atoms, elements, compounds, solutions, chemical and physical changes, acids and bases, chemical equations, stoichiometry, and other basic concepts.

Prerequisites: Current enrollment in Algebra; Algebraic skills (do not enroll if you have passed Environmental Chemistry or General Chemistry)

Textbook: Physical Science - Glencoe, 2002

SC-PC-01 CLASSIFICATION OF MATTER Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

Students will classify matter according to phase and composition.

ASSESSMENT STANDARD: Students will be able to classify matter according to phase and composition. Students will define the particle nature in the three common phases and explain the phase changes in relationship to energy.

- classify as gas, liquid, or solid
- classify as element, compound, and mixture
- define evaporation, condensation, freezing, melting, and sublimation

SC-PC-01-01 - Matter Classified According to Phase/Composition (Objective)

C-CS - Critical-Assessment at Content Standard

The students will classify matter according to phase and composition.

ASSESSMENT STANDARD: The student will model the particle nature of gasses, liquids, and solids.

SC-PC-01-02 - Transformation of Matter (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the transformation of matter from one phase to another and the energy required to cause such a change.

SC-PC-01-03 - Pressure, Temperature, Volume of Gasses (Objective)

S - Supporting

The students will describe the relationship between pressure, temperature, and volume of gasses in a closed system.

SC-PC-02 CHEMICAL SCIENCE METHODS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will demonstrate their knowledge of the atomic structure by defining its components, processes, and its role in the make up of the periodic table.

ASSESSMENT STANDARD: Students will identify atomic structure by defining the component parts of the atom. They will use the periodic table to describe the atomic structure of different elements.

- diagram an atom
- use periodic table to determine the number of protons, neutrons, and electrons in various elements

SC-PC-02-01 - Atomic Structure and the Periodic Table (Objective)

C-CS - Critical-Assessment at Content Standard

The students will model the structure of atoms and molecules.

ASSESSMENT STANDARDS: The students will model the particle nature of atoms and models.

SC-PC-02-02 - Arrange Elements on the Periodic Table (Objective)

C-CS - Critical-Assessment at Content Standard

The students will demonstrate an ability to arrange elements on the periodic table according their atomic structure.

SC-PC-03 CHEMICAL INTERACTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

Students will show understanding of chemical names, symbols, equations, bonds, and chemical reactions.

SC-PC-03-01 - Chemical Symbols, Names, Equations (Objective)

C - Critical--Assessment Reporting Required

The students will use symbols, names, and equations to accurately describe chemicals, chemical bonds, and chemical reactions.

ASSESSMENT STANDARDS: The students will write and balance chemical equations to describe common chemical reactions including:

- Synthesis
- Replacement
- Decomposition

SC-PC-03-02 - Classify Chemical Reactions (Objective)

S - Supporting

The students will demonstrate the ability to classify chemical reactions according to the energy changes.

SC-PC-03-03 - Acids, Bases, Salts (Objective)

S - Supporting

The students will identify characteristics of and classify common compounds as acids, bases, or salts.

SC-PC-04 SCIENCE LAB SAFETY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will follow laboratory safety procedures.

ASSESSMENT STANDARD: Students will follow laboratory safety procedures and understand the hazards present in the chemistry laboratory. Students will accurately measure and record observations in the laboratory.

SC-PC-04-01 - Understand and Follow Safety Procedures (Objective)

C-CS - Critical-Assessment at Content Standard

The students will understand the hazards present in the chemistry laboratory and will follow lab safety procedures. They will accurately measure and record observations.

last update 6/24/2009

pc

Campbell County School District #1
Gillette, Wyoming

SCIENCE - PHYSICS I

CCHS - Physics is an introduction to the physical laws which govern our universe. There are mathematical equations that go with the laws and theories that are studied in each unit. Problem solving requires an understanding of algebra and geometry. Laboratory work is done to supplement what is learned in lecture, but the main emphasis of the class is on understanding ideas and problem solving. Computer work is done to reinforce physics concepts presented. Prerequisite: Average or better grade in Algebra I and Geometry.

WJSHS - Physics is the study of the relationship between matter and energy. Students will develop attitudes of curiosity and involvement with phenomena in their natural environments. Topics discussed during the first quarter include: mechanics and Newton's Laws of motion. Second quarter focuses on planetary motion, heat, waves, light, sound nuclear physics, and electricity.

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-PH-01 DATA COLLECTIONS/SCIENTIFIC CALCULATIONS (Content Standard)

State Standard and Benchmark Correlation:

none

Students will demonstrate an understanding of the importance of accuracy, precision, and significant figures and how they relate to data collection in science.

SC-PH-01-01 - Accuracy, Precision, Significant Figures (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- a) Explain the difference between accuracy and precision
 - Demonstrate the proper use of significant facts in data collection and scientific calculations.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of accuracy, precision, and significant figures. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-02 MECHANICAL MOTION (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Interaction of Energy and Matter

SC11.1.14 Motions and Force

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

Students will demonstrate an understanding of the relationship between time, displacement, velocity, and acceleration; they will demonstrate an understanding of Newton's three laws of motion and how they impact on daily life.

SC-PH-02-01 - Velocity and Acceleration (Objective)

C-CS - Critical-Assessment at Content Standard

The students will:

- determine the average velocity and acceleration of a moving object.
- solve simple two-dimensional velocity and acceleration problems.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of velocity and acceleration. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-02-02 - Newton's Three Laws (Objective)

C-CS - Critical-Assessment at Content Standard

The students will:

- demonstrate an ability to apply the three laws of motion to real situations.
- calculate simple force problems using the second law.
- understand the concept of inertia.
- describe the difference between weight and mass.
- understand the concept of friction.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of Newton's three laws. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-03 VECTORS (Content Standard)

State Standard and Benchmark Correlation:

SC11.01.14 Motions and Force

Students will demonstrate an understanding of the vector and scalar quantities.

SC-PH-03-01 - Vector, Scalar Quantities; Vector Components (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- differentiate between vector and scalar quantities.
- demonstrate the ability to draw a representative vector to scale for a given quantity.
- graphically add two vectors
- resolve a vector into its components.
- calculate simple motion problems using vector components.

ASSESSMENT STANDARDS: The students will demonstrate an understanding of vectors. The demonstration may be in the form of an oral presentation, interview, written

report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-04 UNIVERSAL GRAVITATION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.14 Motions and Force

SC11.2.4 Role of Science/Technology in Meeting Human Needs

Students will demonstrate an understanding of the law of universal gravitation.

SC-PH-04-01 - Gravitational Force; Role of Gravity (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- understand that gravity is a property of matter.
- understand the nature of an inverse square relationship.
- calculate the gravitational force between two masses.
- understand the role of gravity in celestial systems.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of the universal law of gravitation. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, or other comparable means.

SC-PH-05 CONSERVATION OF MOMENTUM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.14 Motions and Force

Students will demonstrate an understanding of the conservation of momentum.

SC-PH-05-01 - Concept of Momentum, Calculate Momentum (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- understand the concept of momentum.
- calculate the momentum of an object given its mass and velocity.
- understand the difference between an elastic and inelastic collision.
- solve for an object's final velocity when it's involved in a one-dimensional collision.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of the conservation of momentum. The demonstration may be in the form of oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-06 CONSERVATION OF ENERGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

Students will demonstrate an understanding of work, energy, power, and the conservation of energy and efficiency.

SC-PH-06-01 - Concept of Work; Potential, Kinetic Energy (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- understand the concept of work.
- understand the difference between potential and kinetic energy.
- calculate the potential and kinetic energy for different objects.
- calculate a velocity given the initial potential energy and the final kinetic energy.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of the

conservation of energy. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

SC-PH-07 ROTATIONAL MOTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.14 Motions and Force

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate an understanding of work, energy, power, and the conservation of energy and efficiency.

SC-PH-07-01 - Velocity, Acceleration, Rotation, Inertia (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- understand the concepts of angular velocity and acceleration.
- understand the concepts of centripetal and centrifugal forces.
- solve simple rotational motion problems.
- understand angular inertia and angular momentum.
- apply the concepts of rotational motion to the motion of satellites and planetary motion.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of simple rotational motion. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment or other comparable means.

SC-PH-08 WAVES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Energy and Matter

Students will demonstrate an understanding of waves and how they transfer energy. The students will also understand the nature of sound and electromagnetic waves.

SC-PH-08-01 - Wave Characteristics, Sound, Light (Objective)

C-NR - Critical-District Reporting Not Required

The students will:

- understand the relationship of a wave with energy.
- understand frequency, period, phase, wavelength, refraction, reflection, diffraction, wave interference, and wave velocity.
- understand the difference between material and electromagnetic waves.
- understand how sound is propagated through air.
- describe how light is propagated through space.
- find the focal length of a spherical mirror.
- find the focal length of a double convex lens.
- calculate simple optics problems.

ASSESSMENT STANDARDS: Students will demonstrate an understanding of waves. The demonstration may be in the form of an oral presentation, interview, written report, laboratory or graphing exercise, objective assessment, or other comparable means.

Campbell County School District #1
Gillette, Wyoming

Physical Science / Physics
(1 Semester)

This is an introductory course in to the field of Physical Science. Both lab and math work will accompany the course, with care taken not to discriminate against students with border-line math skills. The course work will include the study of the metric system of measurement, velocity, force, motion, WORK, mechanical advantage, acceleration, simple machines, waves, light, sound, and other physical science concepts.

Prerequisite: Current enrollment in Algebra; Algebra skills required. (Physical Science/Physics not recommended if you have successfully passed Physics.)

Textbook: Physical Science - Glenco, 2002

SC-PI-01 PHYSICAL SCIENCE METHODS (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will use various instruments to measure distance, volume, mass, time, density, and temperature.

SC-PI-01-01 - Using Instruments to Measure (Objective)

S - Supporting

The students will use instruments to accurately measure distance, volume, mass, time, temperature, and density.

ASSESSMENT STANDARDS: Students will use the proper tools and instruments to accurately measure distance, volume, mass, time, density, and temperature.

- calculate area

- calculate volume

SC-PI-01-02 - Construct/Interpret Graphs (Objective)

S - Supporting

The students will construct and interpret graphs.

SC-PI-01-03 - Convert Between Metric and English Systems (Objective)

S - Supporting

The students will demonstrate the ability to convert between metric and English systems of measurement.

SC-PI-02 MOTION (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.14 Motions and Force

Students will demonstrate and graph their understanding of speed, acceleration, momentum, and the relationship between these factors.

SC-PI-02-01 - Measure/Graph Speed, Acceleration, Momentum (Objective)

C - Critical--Assessment Reporting Required

The students will accurately measure and graph speed, acceleration, and momentum for moving objects and the period of a pendulum.

ASSESSMENT STANDARDS: Students will measure and calculate speed, acceleration, and momentum.

- gather data
- calculate acceleration
- calculate momentum

SC-PI-03 - ENERGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Energy and Matter

Students will define, measure, calculate, and give examples of potential and kinetic energy.

SC-PI-03-01 - Measure/Calculate Potential and Kinetic Energy (Objective)

C - Critical--Assessment Reporting Required

The students will demonstrate the ability to measure and calculate the potential and kinetic energy in open and closed systems.

ASSESSMENT STANDARDS: The students will measure and calculate kinetic/potential energy and heat exchange within a system.

SC-PI-03-02 - Conversion of Energy (Objective)

S - Supporting

The students will model the conversion of energy from one form to another.

SC-PI-04 MACHINES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.13 Energy and Matter

Students will study and cite examples of simple machines as well as calculating AMA and IMA for each.

SC-PI-04-01 - Measure/Calculate AMA and IMA for Simple Machines (Objective)

S - Supporting

The students will measure and calculate AMA and IMA for six simple machines.

ASSESSMENT STANDARDS: The students will demonstrate the ability to measure and calculate Ideal Mechanical Advantage and Actual Mechanical Advantage for all simple machine.

last update 6/24/2009

pc

Campbell County School District # 1
Gillette, Wyoming

Science - Grade 7 at WJSHS

Seventh-grade Science at WJSHS is a Life Science year. Students will start the first semester by exploring what science is and how scientists work, as well as significant scientific figures in history. Emphasis will be placed on correct use of the processes, skills, and methods of scientists. At the end of the first semester, students will study the Interactions of Living Things. As second semester approaches, students will learn about Cells and Heredity. In addition, Change Over Time and Classification will be explored. Students will learn these concepts using a variety of methods including traditional textbook work, vocabulary activities, projects, modeling, and laboratory experiments.

Textbook/Resources: Holt Science and Technology Short-Course series, 2002

SC-W7-01 ORGAN SYSTEMS AND ECOSYSTEMS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.1 Levels of Organization in Living Systems

SC8.1.6 Interrelationships of Populations/Ecosystems

Students will demonstrate an understanding of ecosystems and organ systems.

SC-W7-01-01 - Ecosystems (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe and illustrate components and interactions of an ecosystem, including identifying producers, consumers, and decomposers; they will identify biotic and abiotic factors in an ecosystem.

SC-W7-01-02 - Organ Systems (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate an understanding of organ systems by analyzing the structure and function of an organ system. Students will describe the levels of organization in a human body system.

**SC-W7-02 ADAPTATION OF ORGANISMS TO ENVIRONMENTAL CHANGES
(Content Standard)**

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.4 Diversity of Organisms

SC8.1.5 Behavior and Adaptation

SC8.1.6 Interrelationships of Populations/Ecosystems

Students will explain adaptation on an organismal and population scale.

SC-W7-02-01 - Adaptation (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe how organisms and populations adapt and respond to changes in their environment.

Essential Content:

- Population
- Human factors
- Limiting factors
- Extinction
- Adaptations

SC-W7-03 HEREDITY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.2 Reproduction and Heredity

Students will explain and apply principles of inheritance.

SC-W7-03-01 - Heredity (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe reproduction as a characteristic of all living systems which is essential to the continuation of species. Students will identify and interpret traits, patterns of inheritance, and the interaction between genetics and environment.

Essential Content:

- Basic laws of Mendelian Genetics
- Punnet Squares
- Monohybrid Crosses

SC-W7-04 EVOLUTION AS A THEORY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.3 Evolution as a Theory

Students will explain how species evolve over time.

SC-W7-04-01 - Evolution and Natural Selection (Objective)

C-CS - Critical-Assessment at Content Standard

The students will explain evolution as a theory and apply the theory to the diversity of species which results from natural selection.

Essential Content:

- Natural selection
- The theory of biological evolution

SC-W7-05 SCIENTIFIC METHOD (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.1 Research Scientific Info, Present Findings

SC8.2.2 Use Inquiry to Conduct Scientific Investigations

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

Students will demonstrate proper use of scientific method.

SC-W7-05-01 - Proper Use of Scientific Method (Objective)

C-CS - Critical-Assessment at Content Standard

The students will demonstrate proper use of scientific method.

SC-W7-05-02 - Conduct an Experiment; Report and Analyze (Objective)

C-CS - Critical-Assessment at Content Standard

The students will conduct a scientific experiment, and they will report and analyze the data obtained.

SC-W7-05-03 - Identify a Variable (Objective)

C-CS - Critical-Assessment at Content Standard

The students will identify a variable.

SC-W7-06 TECHNOLOGY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

Students will utilize technology to collect, store, manipulate, and present information.

SC-W7-06-01 - Utilizing Technology (Objective)

C-CS - Critical-Assessment at Content Standard

The students will effectively use appropriate technologies for collecting, analyzing, and communicating information. This may include but not be limited to the following hardware and software: computers, video recorders, microscopes, video microscopes, probes, camcorders, electronic still cameras, word processing program, presentation program, and electronic reference materials.

last update 6/24/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Grade 8 - WJSHS

Eighth-grade Science at WJSHS is Physical Science year. After reviewing Lab Safety and The Scientific Method, students will review Earth's Features and Processes, as well as the Solar System. Students will be introduced to the Properties of Matter and the States of Matter. After mastering these concepts, students will explore Elements, Compounds, and Mixtures, as well as Atoms and The Periodic Table. As the year progresses, students will learn about Motion, Forces, Work, and Machines using a variety of methods, including traditional textbook work, vocabulary activities, projects, modeling, and laboratory experiments.

Textbook/Resources: Holt Science and Technology Short-Course series, 2002

SC-W8-01 PHYSICAL SCIENCE - CHEMISTRY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.10 Structure and Properties of Matter

SC8.1.11 Physical and Chemical Changes in Matter

Students will explain and illustrate the basic principles of chemistry.

Assessment: written test/percent score

SC-W8-01-01 - Structure of an Atom (Objective)

C-CS - Critical-Assessment at Content Standard

The students will describe the structure of an atom and the location of its parts.

SC-W8-01-02 - Physical vs. Chemical Changes and Properties (Objective)

C-CS - Critical-Assessment at Content Standard

The students will distinguish between physical and chemical changes and properties, and they will explore chemical reactions.

SC-W8-01-03 - Measurement of Matter (Objective)

C-CS - Critical-Assessment at Content Standard

The students will measure length, mass, and volume; they will calculate density.

SC-W8-02 PHYSICAL SCIENCE - PHYSICS (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.1.14 Effects of Motions and Forces

Students will explain and illustrate the basic principles of motion and force.

SC-W8-02-01 - Forces, Motion Work (Objective)

C-CS - Critical-Assessment at Content Standard

The students will measure forces, motion, and work; they will distinguish between potential and kinetic energy:

- Identify and describe forces such as gravity, friction, and magnetism.
- Calculate speed, velocity, and acceleration.
- Calculate work.
- Distinguish between potential energy and kinetic energy.

SC-W8-03 EARTH AND SPACE SCIENCE (Content Standard)

State Standard and Benchmark Correlation:

SC8.1.7 The Earth in the Solar System

SC8.1.9 The Earth's History

Students will study Earth's structure and dynamics and its place in the solar system.

SC-W8-03-01 - Earth Features and Processes (Objective)

S - Supporting

Students will examine the structure of the Earth, identifying layers of the Earth, considering plate movement, and its effects, and recognizing landforms which result from the constructive and destructive forces.

Essential Content:

- Features on the Earth's surface and the combination of slow and rapid processes that constantly change those features.

SC-W8-03-02 - Earth and the Solar System (Objective)

S - Supporting

The students will describe Earth as the third planet in the solar system; they will understand the effects of the sun as a major source of energy, gravitational forces, and motions of objects in the solar system.

Essential Content:

- The characteristics and movement patterns of objects in the solar system.

SC-W8-04 SCIENTIFIC METHOD (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.1 Research Scientific Info, Present Findings

SC8.2.2 Use Inquiry to Conduct Scientific Investigations

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

Students will demonstrate proper use of scientific method.

SC-W8-04-01 - Proper Use of Scientific Method (Objective)

C-CS - Critical-Assessment at Content Standard

The students will demonstrate the proper use of scientific method.

SC-W8-04-02 - History of Science (Objective)

C-CS - Critical-Assessment at Content Standard

The students will identify and research scientists and inventors who have impacted scientific history.

SC-W8-05 TECHNOLOGY (Content Standard)

C - Critical--Assessment Reporting Required

State Standard and Benchmark Correlation:

SC8.2.3 Clearly/Accurately Communicate Results, Other Info

SC8.2.4 Meeting Human Needs With Science and Technology

SC8.2.5 Use Scientific/Safety Equipment, Recognize Hazards

Students will utilize technology to collect, store, manipulate, and present information.

SC-W8-05-01 - Utilizing Technology (Objective)

C-CS - Critical-Assessment at Content Standard

The students will effectively use appropriate technologies for collecting, analyzing, and communicating information. This may include but not be limited to the following hardware and software: computers, video recorders, microscopes, video microscopes, probes, camcorders, electronic still cameras, word processing program, presentation program, multimedia, and electronic reference material.

last update 6/24/2009

pc

Campbell County School District #1
Gillette, Wyoming

Science - Grade 9 - WJSHS

Ninth-grade Science at WJSHS places emphasis on Earth and Space Science. Students will first review The Scientific Method and then move on to learning about the Origin and Evolution of the Earth System. Students will learn how to identify Minerals and Rocks, and they will study Chemical Reactions and Biogeochemical Cycles. In addition, Students will gain knowledge of The Solar System and Galactic Morphology. Students will learn these concepts using a variety of methods, including traditional textbook work, vocabulary activities, projects, modeling, and laboratory experiments.

Textbook/Resources: Earth Science - McDougal-Littel, 2005

SC-W9-01 EARTH MATERIALS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.8 Origin and Evolution of the Earth System

SC11.1.10 Structure and Properties of Matter

SC11.1.11 Chemical Reactions

Using rock and mineral identification and classification as the geologic objective, students will develop and understanding of the complexity and physical attributes of minerals.

SC-W9-01-01 - Structure and Properties of Matter (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the structure of matter, its properties, and chemical interactions. Students will recognize that the organization of the periodic table is based on the elements' outermost electrons and that these groups have similar properties.

SC-W9-01-02 - Chemical Reactions (Objective)

C-NR - Critical-District Reporting Not Required

The students will realize that chemical reactions take place constantly; that the type of reaction is dependent upon the elements involved; and that chemical reactions can occur at different rates and result in the formation of different substances which have unique physical properties.

SC-W9-01-03 - Use of Key to Identify Minerals/Properties/Rocks (Objective)

C - Critical--Assessment Reporting Required

The students will demonstrate an ability to conduct simple tests to identify common minerals and rocks, research their chemical formulas, and relate their chemical nature to an outstanding property. The simple tests and classification schemes include:

- Identifying crystal shape, hardness, streak, cleavage, luster, specific gravity, color, diaphaneity, fracture, reaction to acid, fluorescence, double refraction, and magnetism.
- Determining the classification of rock-forming mineral groups into silicates, carbonates, iron oxides, and iron sulfides.
- Determining the methods and types of rock formation.

SC-W9-02 SURFACE PROCESSES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.7 Geochemical Cycles

SC11.1.8 Origin and Evolution of the Earth System

Students will analyze and interpret the factors which cause changes to the earth's surfaces. They will explain the forces which cause weathering, erosion, deposition, and plate tectonics; they will describe the effects of these processes on the earth's surface.

SC-W9-02-01 - Lithospheric Plates and Tectonic Activities (Objective)

C - Critical--Assessment Reporting Required

The students will identify the major Lithospheric plates and the tectonic activities associated with their boundaries.

SC-W9-02-02 - Factors Which Change the Earth's Surface (Objective)

C-NR - Critical-District Reporting Not Required

The students will identify agents which cause erosion, weathering, deposition, and tectonic plate movements.

SC-W9-03 BIOCHEMICAL CYCLES (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.4 Interdependence of Organisms

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.1.7 Geochemical Cycles

SC11.1.10 Structure and Properties of Matter

Students will develop an understanding of living systems' relationships with and dependence on the hydrological and geological environment.

SC-W9-03-01 - Geochemical Cycles (Objective)

C-NR - Critical-District Reporting Not Required

The students will describe the earth as a closed system and will understand the interdependence of the biosphere, hydrosphere, and geosphere with regard to the basic materials and cycles of water, rock, nitrogen, carbon, and oxygen.

SC-W9-03-02 - Biogeochemical Cycles Culmination (Objective)

C - Critical--Assessment Reporting Required

The students will demonstrate their understanding of the interdependence and relationships of the biosphere, hydrosphere, and geospheres.

SC-W9-04 SOLAR SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

Students will understand the solar system.

SC-W9-04-01 - Construct a Solar System Model (Objective)

S - Supporting

The students will be given the solar system dimensions, and each student will construct a scale model of the solar system including the planets, moons, comets, the nearest star, and the galactic center.

SC-W9-04-02 - Diagram and Label Lunar Phases (Objective)

S - Supporting

The students will label correctly each phase of the moon, given the sky position and time of the day.

SC-W9-05 GALACTIC MORPHOLOGY (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.9 Origin and Evolution of the Universe

SC11.2.1 Research Scientific Info; Present Findings

Students will understand galactic morphology.

SC-W9-05-01 - Classify the Galactic Objects (Objective)

C - Critical--Assessment Reporting Required

The student will describe and identify quasars, black holes, galaxy types, clusters, and radio sources in the universe. Students will research a celestial “object” and present their findings.

SC-W9-06 SCIENTIFIC METHOD (Content Standard)

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communicate the Result of Scientific Inquiry

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate proper use of scientific method.

SC-W9-06-01 - Conduct an Experiment; Analyze and Report Data (Objective)

C - Critical--Assessment Reporting Required

The students will conduct an experiment, and they will analyze and report the data.

last update 6/24/2009

pc

Campbell County School District #1
Gillette, Wyoming

SCIENCE
Fitness Physiology

Fitness Physiology is the study of the human body structure and functions, with an emphasis on the body systems associated with physical fitness, athletics, and the performance side of the health sciences. This class is designed to give the student an appreciation of the complexity of the human body and to learn the basic anatomy and physiology of some major body systems. Laboratory work is used to reinforce many concepts, and this work will include dissection.

Prerequisite: Above-average grade in Biology

Textbook: Structure and Function of the Body – Mosby, 2004

Advanced Designation Course - Science

This course is identified as an Advanced Designation Course. Students meeting the requirements of the Advanced Performance Level as defined in the Wyoming Content and Performance Standards will be considered Advanced in the Science content area.

Students performing at the advanced level in Science understand the dynamic nature of science and make connections among unifying concepts and processes to explain the natural world. They are able to extend inquiry to analyze and synthesize scientific information to generate new questions. These students are able to construct personal knowledge independently and apply and critique scientific information to make informed decisions about societal issues. They employ a variety of appropriate technological tools and communication skills

Students who are Advanced in at least five of the nine content areas and Proficient in the others will have the Advanced Endorsement placed on their grade transcript.

SC-FP-01 INTRODUCTION TO MATTER (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.10 Structure and Properties of Matter

Students will describe the levels of biological organization, understand anatomical terms related to position and body region and will explain general principles of biochemistry.

SC-FP-01-01 – Levels of Organization (Objective)

C – NR – Critical – District Reporting Not Required

Students will identify the levels of organization within the human body, from atom to organ system.

SC-FP-01-02 – Anatomical Position/Region/Direction (Objective)

C – NR – Critical – District Reporting Not Required

Students will utilize the systems and terminology of anatomical orientation and direction to locate and identify body parts.

SC-FP-01-03 – General Biochemistry (Objective)

C – NR – Critical – District Reporting Not Required

Students will describe and understand atoms, molecules, and macromolecules and their roles in human systems.

SC-FP-02 CELLS, TISSUES AND ORGAN SYSTEMS (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe cellular structure and function, tissues and their functions, and identify major organ systems.

SC-FP-02-01 – Cell Structure and Function (Objective)

C – NR – Critical-District Reporting Not Required

Students will identify cell organelles and their function and demonstrate an understanding of major cell processes.

SC-FP-02-02 – Tissues and Organ Systems (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe various tissue types and their function and identify the major organ systems.

SC-FP-03 MUSCULAR SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe the structure and function of the muscular system.

SC-FP-03-01 – Muscle Tissue Types (Objective)

C – NR – Critical-District Reporting Not Required

Students will identify and describe the characteristics, location and functions of the three major muscle tissue types.

SC-FP-03-02 – Skeletal Muscle (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the location, structure and function of specific human skeletal muscles.

SC-FP-03-03 – Muscle Physiology (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the physiology of muscular contraction and the effects of exercise on skeletal muscles.

SC-FP-03 MUSCULAR SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe the structure and function of the muscular system.

SC-FP-03-01 – Muscle Tissue Types (Objective)

C – NR – Critical-District Reporting Not Required

Students will identify and describe the characteristics, location and functions of the three major muscle tissue types.

SC-FP-03-02 – Skeletal Muscle (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the location, structure and function of specific human skeletal muscles.

SC-FP-03-03 – Muscle Physiology (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the physiology of muscular contraction and the effects of exercise on skeletal muscles.

SC-FP-04 CIRCULATORY SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will demonstrate an understanding of the circulatory system.

SC-FP-04-01 – Blood (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the composition and function of blood and its elements, and describe the role of blood and lymphatic tissue in the immune system.

SC-FP-04-02 – The Heart and Blood Vessels (Objective)

C – NR – Critical-District Reporting Not Required

Students will investigate the anatomy and function of the heart as well as the structure and function of arteries, veins, and capillaries. Students will monitor cardiac physiology.

SC-FP-05 RESPIRATORY SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe the structure, function and control of the respiratory system.

SC-FP-05-01 – Structure and Function of the Respiratory System (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the structure and function of the lungs and respiratory tract.

SC-FP-05-02 – Regulation and Monitoring of Respiration (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe feedback systems that monitor and regulate the rate of respiration.

SC-FP-06 DIGESTIVE SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe the structure and function of the digestive system.

SC-FP-06-01 – Gastrointestinal Tract and Liver (Objective)

C – NR – Critical-District Reporting Not Required

Students will identify and describe location and function of the major digestive organs.

SC-FP-06-02 – Digestion, Absorption, and Metabolism (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the processes involved in digestion and absorption of food, and the metabolism of macronutrients.

SC-FP-07 URINARY SYSTEM (Content Standard)

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

Students will describe the structure and function of the urinary system.

SC-FP-07-01 – Urinary System Components (Objective)

C – NR – Critical-District Reporting Not Required

Students will identify and describe the structure, location and functions of the kidneys, ureters, bladder and urethra.

SC-FP-07-02 – Urinary System Processes (Objective)

C – NR – Critical-District Reporting Not Required

Students will describe the processes involved in urine formation and the maintenance of electrolyte balance in the human body.

Campbell County School District #1
Gillette, Wyoming

Science – Natural Resource Geology (CCHS)

This course provides a framework to examine the historical and contemporary uses of traditional and alternative energy sources in Wyoming. The focus provides a more geologic context on energy resources, in addition to state-specific resource inventories and potential. This course is designed for sophomore students enrolled in the CCHS Energy Academy.

Textbook/Resources: Earth Science - McDougal-Littel, 2005

SC-NG -01 PHOTOSYNTHESIS, THE CARBON CYCLE, MATTER & ENERGY ORGANIZATION IN SYSTEMS (Content Standard)

C – Critical – Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.1 The Cell

SC11.1.5 Matter, Energy, Organization in Living Systems

SC11.1.7 Geochemical Cycles

Students will chart the energy cycle from sun to plant cell through the chemistry of photosynthesis, to decay, to burial and fossil fuel energy reserve potential, to energy liberation and utilization of fossil fuel use.

ASSESSMENT: A student generated model (rubric score) will be used to evaluate the students' level of understanding.

SC-NG-01-01 – Plant Cell and Photosynthesis (Objective)

C-CS - Critical-Assessment at Content Standard

Students will understand, explain and illustrate the process by which the chloroplasts of plants and other microorganisms use solar energy to combine carbon dioxide and water to produce the carbon and energy dense compounds which form the fossil fuels we use today to meet human population energy needs.

SC-NG-01-02 – The Geochemical Cycle/Carbon Cycle (Objective)

C-CS - Critical-Assessment at Content Standard

Students will identify and quantify the various carbon reservoirs and recognize that energy drives the movement of carbon from one reservoir to the next, from one physical state to another.

SC-NG-01-03 – Matter, Energy, Organization in Living and Reserve Carbon Pools (Objective)

C-CS - Critical-Assessment at Content Standard

Students analyze and explain the need in living things for a continuous input of energy to maintain the health of the individual. The primary energy impetus originates with the sun and is cycled through photosynthesis to the plant and subsequently to other life forms. Fossil fuels are trapped energy sources which when burned utilize this stored energy and alter the carbon reservoir dynamics.

SC-NG -02 GEOLOGY, GEOGRAPHY, ENERGY RESOURCES, and BIOLOGICAL EVOLUTION (Content Standard)

C – Critical – Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.3 Biological Evolution

SC11.1.8 Origin and Evolution of the Earth System

Students will understand, explain and illustrate the interrelationship between geology and geography as it pertains to Wyoming's energy profile.

ASSESSMENT: A student generated model (rubric score) will be used to evaluate the students' level of understanding.

SC-NG-02-01 – Geological and Biological History (Objective)

C-CS - Critical-Assessment at Content Standard

Students will investigate and explain the geological and biological history of Wyoming, relative to the formation of fossil fuels, and the evolution and diversity of their plant and animal origins.

SC-NG-02-02 – Wyoming Geology and Geography (Objective)

C-CS - Critical-Assessment at Content Standard

Students will apply their knowledge of Wyoming's geological history, its geologic formations, and its physical landscape to understand the state's potential for development of both renewable and nonrenewable energy sources.

SC-NG -03 ENERGY SCIENCE (Content Standard)

C – Critical – Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.1.12 Conservation of Energy and Increase in Disorder

SC11.1.13 Interactions of Energy and Matter

Students will explain and apply the science that governs the flow of energy from source to consumer, including energy exploration, extraction, siting, generation, transmission, and consumption. Students will examine the efficiencies and impacts of various energy sources.

ASSESSMENT: A student generated project (rubric score) will be used to evaluate the students' level of understanding.

SC-NG-03-01 – Energy Generation and Consumption (Objective)

C-CS - Critical-Assessment at Content Standard

Students will demonstrate an understanding of basic energy units and principles of energy generation and transmission.

SC-NG-03-02 – Energy Sources (Objective)

C-CS - Critical-Assessment at Content Standard

Students will analyze the major energy sources (nonrenewable and renewable) in terms of extraction/generation, efficiencies, limitations, and impacts. Analysis will include: coal, natural gas, nuclear, solar, geothermal, hydroelectric, wind, petroleum, bio-fuels.

SC-NG-03-03 – Energy Transformers (Objective)

C-CS - Critical-Assessment at Content Standard

Students will quantify the energy gain or loss of the various potential and kinetic energy transformations and recognize that as energy is transferred, matter becomes less ordered.

SC-NG-03-04 – Personal Energy Inventory (Objective)

C-CS - Critical-Assessment at Content Standard

Students will assess and evaluate their use of energy as an individual, and identify conversation strategies

SC-NG-03-05 – Energy Inventory (Objective)

C-CS - Critical-Assessment at Content Standard

Students will create an inventory of energy generation and use in Wyoming, including net import/export, primary energy sources, and their location. Students will assess Wyoming's inventory of energy resources.

SC-NG -04 SCIENTIFIC METHOD (Content Standard)

C – Critical – Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.2.1 Research Scientific Info; Present Findings

SC11.2.2 Use Inquiry to Conduct Scientific Investigations

SC11.2.3 Communication the Result of Scientific Inquiry

SC11.2.4 Role of Science/Technology in Meeting Human Needs

SC11.2.5 Use Equipment Safely, Observe Safety Procedures

Students will demonstrate proper use of scientific method.

ASSESSMENT: A rubric will be used to evaluate the students' level of understanding/application/analysis. The rubric will be related to the specific experience of a student-generated and executed project.

SC-NG-04-01 – Scientific Investigation (Objective)

C-CS - Critical-Assessment at Content Standard

Students will design, perform, and communicate the results of an experiment related to geology/energy resources, including but limited to energy generation, efficiency, transmission and conservation.

SC-NG -05 ENERGY ISSUES (Content Standard)

C – Critical – Assessment Reporting Required

State Standard and Benchmark Correlation:

SC11.2.4 Role of Science/Tech in Meeting Human Needs

SC11.3.2 Examine Use of Scientific Info for Decision-Making

Students will analyze and report upon an issue related to the extraction, generation, transmission, or consumption of energy.

ASSESSMENT: A rubric will be used to evaluate the students' level of understanding/analysis. The rubric will be related to the specific experience of a student group-generated and executed project.

New 2008 – updated 8/18/2009

pc