Adventist Education

A JOURNEY TO EXCELLENCE

SECONDARY SCIENCE STANDARDS | 2019

Science

2019

SECONDARY SCIENCE STANDARDS
IN SEVENTH-DAY ADVENTIST SCHOOLS

OFFICE OF EDUCATION | North American Division Seventh-day Adventist Church

Science Standards

OUR GOAL

The goal of Seventh-day Adventist education is about more than quality teachers providing innovative instruction. Adventist education aims to provide student learning infused with Christian faith and an Adventist worldview. To achieve this goal Seventh-day Adventist standards for grades 9-12 subjects have been carefully developed to embody Seventh-day Adventist beliefs and to prepare students for life-long learning, equipping them for earthly service and heavenly citizenship. An education of this kind imparts strong academic knowledge and a clear picture of Christ and His love for mankind.

These standards focus on what students should know, understand and be able to do. They will be a useful tool for teachers in developing lessons and ensure a thorough preparation for college or university when fully implemented across the curriculum.

Seventh-day Adventist Secondary Standards:

1. Provide clear expectations for student learning and accountability.
2. Provide an essential user-friendly tool for developing instruction.
3. Transform textbooks from curriculum guide to a resource for instruction.
4. Provide for a complete and uniform Adventist secondary curriculum.
5. Have been developed exclusively by Seventh-day Adventist educators.
6. Have been aligned with the goals of Journey to Excellence
7. Have been developed using national and state standards, Adventist curriculum guides, and standards compendiums from McRel and Ten Sigma.

RATIONALE

Secondary Science Standards for Seventh-day Adventist Schools seeks to ensure that the beliefs and values of our Adventist Christian faith are integrated into the curriculum. Science instruction from this curriculum should help students learn to see God's image in His creation and reflect His image while developing proficiency in different sciences. This kind of education imparts more than academic knowledge. It fosters the balanced development of the whole person to prepare them for earthly service and heavenly citizenship.

These carefully developed science standards are a practical tool to assist teachers in focusing their instruction so that all students are competent and engaged successfully in understanding, exploring, analyzing, and applying scientific concepts and principles to various life situations. These standards reflect multiple perspectives from diverse spiritual, civic, and social communities. They make interesting and enjoyable connections within the sciences, and between science and other fields of learning. The intent is to focus on the essence of what students should learn and retain.

CREDITS

The following resources were referenced in developing *Secondary Science Standards for Seventh-day Adventist Schools*: a sampling of state standards, the Next Generation Science Standards (NGSS), NAD Curriculum Guide for Science, McREL Compendium of Standards, Ten Sigma Standards, and Journey to Excellence.

STANDARDS CODING

The standards and essential learnings have been coded so that educators can easily refer to them in their curriculum, instruction, assessment, and professional development activities. The coding system begins with these course abbreviation: A&P—Anatomy and Physiology, BIO1—Biology I, BIO2—Biology II, CHM—Chemistry, ESC—Earth Science, ECO—Ecology/Environmental Science, PSC—Physical Science, PHY—Physics. The first numeral (CHM.3.2) refers to the standard and the second numeral (CHM.3.2) refers to the subcategory under the standard. NGSS references are noted. (LS1-2)

JOURNEY TO EXCELLENCE

When the standards on the next page have been met the instruction in this course will have also met some of the Goals and Essential Core Elements for the curriculum in Seventh-day Adventist schools listed in *Journey to Excellence*. The number (1.A) refers to the Goal and the letter (1.A) refers to the Essential Core Element that is met.

ANATOMY & PHYSIOLOGY

1.A,E
2.F
3.C,E
4.B,E
5.A, B,C,D,E,F
6.B,D,F
7.A
8.E,G
9.A
10.A,B,C,D,E,F

BIOLOGY I

1.A,C,E,G,H
2.F
3.A,B,E
4.A,B,E,D
5.A,B,C,E,F
6.A,B,C,D,F
7.A
8.E,G
9.A,C,D
10.A,C,E,F

BIOLOGY II

1.A,C,E,G,H
2.F
3.A,B,E
4.A,B,E,D
5.A,B,C,E,F
6.A,B,C,D,F
7.A
8.E,G
9.A,C,D
10.A,C,E,F

CHEMISTRY

1.A,B,E,F
2.F
4.B,C,E
5.A,C
6.B,C,D,E,F
7.A,D
8.A,C,D,E,F,G
9.A
10.A,B,E,F

EARTH SCIENCE

1.A,E
2.F
4.B,C,D,E
5.A
6.B,C,D,E,F
7.A,D
8.E
9.A,D
10.A,C,D,E,F

ECOLOGY / ENVIRONMENTAL SCIENCE

1.A,E
2.F
4.A,B,C,D,E
5.A
6.B,C,D,E,F
7.A,D
8.C,E
9.A,D
10.A,C,D,E,F

PHYSICAL SCIENCE

1.A,C,E
2.F
4.B
6.B,C,D,F
7.A
8.C,E,F,G
8.E
9.A
10.A,E,F

Anatomy & Physiology

COURSE FOCUS [Apply the following for each content standard.]

A&P.1 Identify SDA Christian principles and values in correlation with science.

- A&P.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- A&P.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- A&P.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- A&P.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- A&P.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

A&P.2 Develop abilities in science. HS-ETS1

- A&P.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- A&P.2.2 Understand and utilize the scientific method of problem solving.
- A&P.2.3 Utilize the principles and methodologies of cooperative learning.

A&P.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- A&P.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- A&P.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- A&P.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- A&P.3.4 Conduct research in the content area.
- A&P.3.5 Engage in various uses of technology.

COURSE CONTENT: Anatomical Orientation, Cells and Tissues, Systems [Understand, explore, analyze, apply.]

A&P.4 Be able to understand principles of anatomy and physiology.

- A&P.4.1 Recognize God as the designer and creator of the human body.
- A&P.4.2 Define and properly use anatomical orientation terminology.
- A&P.4.3 Demonstrate an understanding of the structure of cell types and tissues.
- A&P.4.4 Identify the components within each system (skeletal, digestive, circulatory, etc.). HS-LS1-2
- A&P.4.5 Describe the major chemical and cellular processes necessary for maintaining life (cellular respiration, protein synthesis, mitosis, meiosis). HS-LS1-1, 1-4, 1-6, 1-7, 3-1, 3-2, 3-3

A&P.5 Be able to safely explore human anatomy and physiology.

- A&P.5.1 Examine anatomy of specimens.
- A&P.5.2 Explore human cells and tissues with microscopes. HS-LS1-2
- A&P.5.3 Investigate the function of components within each system. HS-LS1-2, 1-3, 1-7

A&P.6 Be able to analyze human physiology.

- A&P.6.1 Interpret the relationship between the structure and the function of cell types and tissues. HS-LS1-2, 1-7, 3-1, 3-2
- A&P.6.2 Evaluate the relationship between the structure and the function of organs. HS-LS1-3
- A&P.6.3 Correlate the structure of each organ system with its function. HS-LS1-2
- A&P.6.4 Analyze the interdependence of organ systems in the body. HS-LS1-2, 1-3

A&P.7 Be able to apply principles of anatomy and physiology to health and life.

- A&P.7.1 Strengthen belief in God as Designer and Creator from studying anatomy and physiology. HS-LS1-3
- A&P.7.2 Utilize the concepts of anatomy and physiology to improve lifestyle choices. HS-LS3-2

Biology I

COURSE FOCUS [Apply the following for each content standard.]

BIO1.1 Identify SDA Christian principles and values in correlation with science.

- BIO1.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- BIO1.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- BIO1.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- BIO1.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- BIO1.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

BIO1.2 Develop abilities in science. HS-ETS1

- BIO1.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- BIO1.2.2 Understand and utilize the scientific method of problem solving.
- BIO1.2.3 Utilize the principles and methodologies of cooperative learning.

BIO1.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- BIO1.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- BIO1.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- BIO1.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- BIO1.3.4 Conduct research in the content area.
- BIO1.3.5 Engage in various uses of technology.

COURSE CONTENT: Cell Structure and Processes, Genetics, Taxonomy, Ecology [Understand, explore, analyze, apply.]

BIO1.4 Be able to understand basic biological concepts.

- BIO1.4.1 Acknowledge God as Creator of life while recognizing divergent theories. HS-LS4-1, 4-2, 4-4, 4-5
- BIO1.4.2 Demonstrate understanding of cellular structures and processes. HS-LS1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7
- BIO1.4.3 Describe the dynamics of genetics and biotechnology. HS-LS1-1, 1-6, 3-1, 3-2, 3-3
- BIO1.4.4 Investigate taxonomy and the relationships among living organisms. HS-LS2-2, 4-2
- BIO1.4.5 Comprehend the interdependence between organisms and their environment. HS-LS1-5, 1-7, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 4-2

BIO1.5 Be able to safely explore biological concepts using the scientific method.

- BIO1.5.1 Manipulate cellular models and samples. HS-LS1-1, 1-4, 1-5
- BIO1.5.2 Test concepts of Mendelian inheritance and evaluate genetic manipulation. HS-LS1-1, 3-1, 3-2, 3-3
- BIO1.5.3 Classify, compare, and examine organisms. HS-LS1-2
- BIO1.5.4 Investigate relationships between organisms within their niche. HS-LS1-3, 2-2, 2-3, 2-4, 2-5, 2-8, 4-3, 4-4
- BIO1.5.5 Research the dynamics, organization, and problems in earth's biomes. HS-LS1-3, 2-1, 2-2, 2-6, 2-7, 4-6

BIO1.6 Be able to analyze biological data.

- BIO1.6.1 Compare and contrast cell diagrams and processes. HS-LS1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7
- BIO1.6.2 Draw conclusions about genetic trends and the ethical ramifications of biotechnology. HS-LS3-2, 3-3
- BIO1.6.3 Evaluate the rationale for the current system of taxonomy.
- BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem. HS-LS1-3, 1-5, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-8, 4-2, 4-3, 4-4
- BIO1.6.5 Assess the environmental issues facing local ecosystems and earth's biomes. HS-LS2-1, 2-2, 2-6, 2-7, 4-5, 4-6
- BIO1.6.6 Validate God as the Author of life, while evaluating aspects of divergent theories of origin. HS-LS4-1, 4-2, 4-4, 4-5

BIO1.7 Be able to apply the principles of biology to health, life, and earth's environment.

- BIO1.7.1 Develop a personal ethical value system regarding a world view of life. HS-LS4-6
- BIO1.7.2 Utilize biological concepts to influence lifestyle choices. HS-LS2-7
- BIO1.7.3 Minimize damage to the environment by practicing good stewardship. HS-LS2-7, 4-5, 4-6

Biology II

COURSE FOCUS [Apply the following for each content standard.]

BIO2.1 Identify SDA Christian principles and values in correlation with science.

- BIO2.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- BIO2.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- BIO2.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- BIO2.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- BIO2.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

BIO2.2 Develop abilities in science. HS-ETS1

- BIO2.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- BIO2.2.2 Understand and utilize the scientific method of problem solving.
- BIO2.2.3 Utilize the principles and methodologies of cooperative learning.

BIO2.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- BIO2.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- BIO2.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- BIO2.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- BIO2.3.4 Conduct research in the content area.
- BIO2.3.5 Engage in various uses of technology.

COURSE CONTENT: Zoology, Embryology, Immunology, Microbiology, Botany [Understand, explore, analyze, apply.]

BIO2.4 Be able to understand major specialty areas of biology.

- BIO2.4.1 Recognize God as the Designer and Creator of all life.
- BIO2.4.2 Observe and model organisms representing the major groups of invertebrate and vertebrate animals.
- BIO2.4.3 Describe the processes of gamete production, fertilization, and development.
- BIO2.4.4 Identify the reactions, causes, and results of immune system function.
- BIO2.4.5 Understand the diversity, impact, and diseases of microorganisms .
- BIO2.4.6 Exhibit an understanding of global conservation efforts.
- BIO2.4.7 Demonstrate understanding of simple and complex plant forms.

BIO2.5 Be able to safely explore biology concepts.

- BIO2.5.1 Manipulate invertebrate and vertebrate animals.
- BIO2.5.2 Investigate the reproductive processes within organisms.
- BIO2.5.3 Explore immune system disorders.
- BIO2.5.4 Examine the role of microbes in epidemiology.
- BIO2.5.5 Research the impact of plant life on the biosphere.

BIO2.6 Be able to analyze biology concepts.

- BIO2.6.1 Ascertain the increasing complexity from invertebrate to vertebrate animals.
- BIO2.6.2 Compare embryological development of different organisms.
- BIO2.6.3 Evaluate immune system responses at the cellular and molecular levels.
- BIO2.6.4 Assess treatment methods and effectiveness in terms of microbial cause.
- BIO2.6.5 Analyze the importance of plant life to human life.
- BIO2.6.6 Validate God as the Author of life, while studying major areas of Biology II.

BIO2.7 Be able to apply the higher concepts of Biology II to life.

- BIO2.7.1 Strengthen belief in God as Designer and Creator by applying the higher concepts of Biology II.
- BIO2.7.2 Utilize the concepts of Biology II to improve lifestyle choices.
- BIO2.7.3 Apply the study of Biology II to ethical issues regarding life.

Chemistry

COURSE FOCUS [Apply the following for each content standard.]

CHM.1 Identify SDA Christian principles and values in correlation with science.

- CHM.1.1 Recognize God's power as Designer, creator, Sustainer, and Redeemer in the universe.
- CHM.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- CHM.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- CHM.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- CHM.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

CHM.2 Develop abilities in science. HS-ETS1

- CHM.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- CHM.2.2 Understand and utilize the scientific method of problem solving.
- CHM.2.3 Utilize the principles and methodologies of cooperative learning.

CHM.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- CHM.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- CHM.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- CHM.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- CHM.3.4 Conduct research in the content area.
- CHM.3.5 Engage in various uses of technology.

COURSE CONTENT: Structure and Properties of Matter, Chemical Interactions, Stoichiometry, Solutions [Understand, explore, analyze, apply.]

CHM.4 Be able to understand basic chemistry concepts.

- CHM.4.1 Recognize God as the Designer and Creator of matter with inherent properties and laws.
- CHM.4.2 Demonstrate understanding of structure and properties of matter. HS-PS1-3, 2-6, 4-3
- CHM.4.3 Describe the interactions of matter and energy (bonding, chemical reactions, conservation). HS-PS1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 3-1, 3-2, 3-4, 4-4
- CHM.4.4 Integrate balanced equations, conversion factors, ratio and proportion, and dimensional analysis. HS-PS1-7
- CHM.4.5 Identify the types and properties of solutions.
- CHM.4.5 Describe the changes in the composition of the nucleus during fission, fusion, and radioactive decay. HS-PS1-8

CHM.5 Be able to safely explore chemistry concepts using the scientific method.

- CHM.5.1 Explore the design of the periodic table and structure of molecules. HS-PS1-1, 1-2
- CHM.5.2 Examine the relationship between energy and chemical reactions (bond, activation, thermal). HS-PS1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 3-1, 3-2, 3-4
- CHM.5.3 Solve stoichiometric problems with appropriate chemical and mathematical skills. HS-PS1-7
- CHM.5.4 Investigate factors that define and affect solutions (pH, concentration, temperature, pressure).

CHM.6 Be able to analyze chemical data.

- CHM.6.1 Correlate the relationship between periodicity and molecular structure in the periodic table. HS-PS1-1, 1-2
- CHM.6.2 Interpret the relationship between energy and chemical reactions. HS-PS1-2, 1-3, 1-4, 3-1, 3-2, 3-4
- CHM.6.3 Evaluate conditions and factors that affect stoichiometric results. HS-PS1-5, 1-6, 1-7
- CHM.6.4 Predict solution changes as factors are manipulated. HS-PS1-5, 1-6
- CHM.6.5 Compare and contrast the processes of nuclear fission, fusion, and radioactive decay. HS-PS1-8

CHM.7 Be able to apply the principles of chemistry to health, life, and the physical environment.

- CHM.7.1 Develop an increased respect for the Designer of all matter in the universe.
- CHM.7.2 Utilize various chemical resources to influence lifestyle choices (warning labels, MSDS, nutritional labels, Internet resources).
- CHM.7.3 Implement chemical principles to chemistry-related issues in society. HS-PS2-6

Earth Science

COURSE FOCUS [Apply the following for each content standard.]

ESC.1 Identify SDA Christian principles and values in correlation with science.

- ESC.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- ESC.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- ESC.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- ESC.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- ESC.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

ESC.2 Develop abilities in science. HS-ETS1

- ESC.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- ESC.2.2 Understand and utilize the scientific method of problem solving.
- ESC.2.3 Utilize the principles and methodologies of cooperative learning.

ESC.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- ESC.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- ESC.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- ESC.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- ESC.3.4 Conduct research in the content area.
- ESC.3.5 Engage in various uses of technology.

COURSE CONTENT: Terminology, Geology, Geologic History, Weather, Water, Astronomy [Understand, explore, analyze, apply.]

ESC.4 Be able to understand the basic laws, principles, and theories of Earth Science.

- ESC.4.1 Recognize God as the Designer and Creator of our earth within the universe while recognizing divergent theories. HS-ESS1-2, 1-6, 2-7
- ESC.4.2 Demonstrate understanding of the structure, composition, and processes of earth (geologic time table, plate tectonics, rocks and minerals). HS-ESS1-5, 1-6, 2-1, 2-3
- ESC.4.3 Become acquainted with the geologic history of the earth (fossil record, absolute vs. relative time). HS-ESS1-5, 1-6
- ESC.4.4 Familiarize students with the factors that affect earth's climate patterns. HS-ESS1-1, 2-2, 2-4
- ESC.4.5 Present the basic concepts of earth's biogeochemical cycles. HS-ESS2-5, 2-6
- ESC.4.6 Describe how stars through fusion produce new elements and energy, and how that energy is transmitted to planetary objects. HS-ESS1-1, 1-3

ESC.5 Be able to safely explore Earth Science concepts.

- ESC.5.1 Observe the structure and composition of rocks and minerals. HS-ESS1-6, 2-1
- ESC.5.2 Explore the fossil record of earth's history from a creationist's paradigm.
- ESC.5.3 Investigate principles of climate and global weather patterns. HS-SSE1-1, 2-4
- ESC.5.4 Examine factors that affect earth's biogeochemical cycles. HS-ESS2-6

ESC.6 Be able to analyze Earth Science concepts.

- ESC.6.1 Classify different types of rocks and minerals.
- ESC.6.2 Correlate the fossil record to earth's history from a creationist's paradigm.
- ESC.6.3 Analyze and predict the relationship between climate and global weather patterns. HS-ESS1-1, 2-4, 3-5
- ESC.6.4 Compare and contrast the relationship between earth's biogeochemical cycles and the factors affecting them. HS-ESS2-6, 3-6
- ESC.6.5 Predict the motion of orbiting objects in the solar system using various models. HS-ESS1-4

ESC.7 Be able to apply fundamentals of Earth Science to life and the earth's environment.

- ESC.7.1 Strengthen belief in God as Designer and Creator by applying the fundamentals of Earth Science. HS-ESS1-6, 2-7
- ESC.7.2 Utilize the concepts of Earth Science to improve lifestyle choices. HS-ESS2-2, 3-1, 3-2, 3-3, 3-4, 3-6
- ESC.7.3 Apply the study of Earth Science to issues regarding the environment. HS-ESS2-2, 2-4, 3-1, 3-2, 3-3, 3-4, 3-6

Ecology/Environmental Science

COURSE FOCUS [Apply the following for each content standard.]

ECO.1 Identify SDA Christian principles and values in correlation with science.

- ECO.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- ECO.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- ECO.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- ECO.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- ECO.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

ECO.2 Develop abilities in science. HS-ETS1

- ECO.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- ECO.2.2 Understand and utilize the scientific method of problem solving.
- ECO.2.3 Utilize the principles and methodologies of cooperative learning.

ECO.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- ECO.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- ECO.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- ECO.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- ECO.3.4 Conduct research in the content area.
- ECO.3.5 Engage in various uses of technology.

COURSE CONTENT: Principles, Population Dynamics, Natural Resources, Energy, Conservation [Understand, explore, analyze, apply.]

ECO.4 Be able to understand the basic principles of Ecology/Environmental Science.

- ECO.4.1 Recognize God as the Designer and Creator of our earth.
- ECO.4.2 Understand the factors that influence organisms within their environment (trophic levels, symbiosis, food chain/web, biomes). HS-LS1-5, 2-3, 2-4, 2-5, 2-8, 4-2, 4-3, HS-ESS3-6
- ECO.4.3 Demonstrate understanding of the nature of population dynamics (plant, animal, and human). HS-LS1-3, 2-1, 2-2, 2-6, 4-4, 4-5
- ECO.4.4 Identify non-energy resources and their effects on the environment. HS-LS2-1, 2-2, 2-3, 2-4, HS-ESS2-6, 3-1, 3-2, 3-3, 3-4, 3-5
- ECO.4.5 Classify conventional and alternative energy sources. HS-PS3-3
- ECO.4.6 Exhibit an understanding of global conservation efforts. HS-LS2-7, 4-6, HS-ESS2-2, 3-1, 3-2, 3-3, 3-4

ECO.5 Be able to safely explore Ecology/Environmental Science concepts.

- ECO.5.1 Examine relationships between organisms within the environment. HS-LS1-5, 2-5, 2-8, 4-2, 4-3
- ECO.5.2 Investigate the factors affecting population dynamics. HS-LS1-3, 2-1, 2-2, 2-6, 4-2, 4-3, 4-4, 4-5, HS-ESS3-4
- ECO.5.3 Survey advantages, disadvantages, and uses of conventional and alternative energy sources. HS-PS3-3
- ECO.5.4 Explore conservation methods for natural resources. HS-LS2-7, 4-6, HS-ESS2-2, 3-1, 3-2, 3-3, 3-4, HS-PS3-3

ECO.6 Be able to analyze Ecology/Environmental Science concepts.

- ECO.6.1 Evaluate factors affecting relationships between organisms within the environment. HS-LS1-5, 2-3, 2-4, 2-5, 2-8, 4-2, 4-3
- ECO.6.2 Research and predict how factors affect population dynamics. HS-LS1-3, 2-1, 2-2, 2-6, 4-2, 4-3, 4-4, 4-5
- ECO.6.3 Compare and contrast advantages, disadvantages, and uses of conventional and alternative energy sources. HS-ESS3-4, HS-PS3-3
- ECO.6.4 Analyze current natural resource conservation methods. HS-LS2-7, 4-6, HS-ESS2-2, 3-1, 3-2, 3-3, 3-4

ECO.7 Be able to apply fundamentals of Ecology/Environmental Science to life and the earth's environment.

- ECO.7.1 Strengthen belief in God as Designer and Creator by applying the fundamentals of Ecology/Environmental Science.
- ECO.7.2 Utilize the concepts of Ecology/Environmental Science to improve lifestyle choices. HS-LS2-7, 4-6, HS-ESS3-1, 3-2, 3-3, 3-4, 3-5
- ECO.7.3 Apply the study of Ecology/Environmental Science to ethical issues regarding the environment. HS-LS2-6, 2-7, 4-6, HS-ESS2-2, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6

Physical Science

COURSE FOCUS [Apply the following for each content standard.]

PSC.1 Identify SDA Christian principles and values in correlation with science.

- PSC.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- PSC.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- PSC.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- PSC.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- PSC.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

PSC.2 Develop abilities in science. HS-ETS1

- PSC.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- PSC.2.2 Understand and utilize the scientific method of problem solving.
- PSC.2.3 Utilize the principles and methodologies of cooperative learning.

PSC.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- PSC.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- PSC.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- PSC.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- PSC.3.4 Conduct research in the content area.
- PSC.3.5 Engage in various uses of technology.

COURSE CONTENT: Structure and Properties of Matter, Measurement and Conversions, Interactions of Matter, Force and Motion, Energy [Understand, explore, analyze, apply.]

PSC.4 Be able to understand the relationships between matter and energy and how they interact.

- PSC.4.1 Recognize God as the Designer and Creator of our physical world.
- PSC.4.2 Introduce the fundamental structure and properties of matter (physical, chemical, periodic table). HS-PS1-1, 1-2
- PSC.4.3 Demonstrate understanding of scientific measurement and expression (conversions, scientific notation).
- PSC.4.4 Become acquainted with the interactions of matter (bonding, reaction types). HS-PS1-1, 1-2, 1-4, 1-5
- PSC.4.5 Familiarize students with the fundamental properties of force and motion (Newton's laws, velocity, acceleration) HS-PS2-1, 2-2, 2-3, 2,4
- PSC.4.6 Present the basic concepts of different energy forms (sound, electromagnetic waves, kinetic, potential, heat, nuclear, etc.). HS-PS1-8, 3-1, 3-2, 3-3, 3-4, 3-5, 4-1

PSC.5 Be able to safely explore Physical Science concepts.

- PSC.5.1 Observe the structure and properties of matter. HS-PS1-3
- PSC.5.2 Explore the interactions of matter. HS-PS1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7
- PSC.5.3 Investigate the properties and interactions of force and motion. HS-PS2-1, 2-2, 2-3, 2-4, 2-5
- PSC.5.4 Examine the fundamental concepts of different energy forms. HS-PS1-4, 1-8, 3-1, 3-2, 3-3, 3-4, 3-5, 4-1

PSC.6 Be able to analyze Physical Science concepts.

- PSC.6.1 Exhibit understanding of the basic structure and properties of matter. HS-PS1-1, 1-2, 1-3, 2-6
- PSC.6.2 Interpret the results of the interactions of matter. HS-PS1-1, 1-2, 1-4, 1-5, 1-6, 1-7, 2-5
- PSC.6.3 Relate the concepts of force to motion. HS-PS2-1, 2-2, 2-3, 2-4
- PSC.6.4 Compare and contrast the different forms of energy. HS-PS1-8, 3-1, 3-2, 3-3, 3-4, 3-5

PSC.7 Be able to apply fundamentals of Physical Science to life and the physical environment.

- PSC.7.1 Strengthen belief in God as Designer and Creator by applying the fundamentals of Physical Science.
- PSC.7.2 Utilize the concepts of Physical Science to improve lifestyle choices. HS-PS2-3, 4-2, 4-4, 4-5
- PSC.7.3 Apply the study of Physical Science to issues regarding the environment. HS-PS4-4

Physics

COURSE FOCUS [Apply the following for each content standard.]

PHY.1 Identify SDA Christian principles and values in correlation with science.

- PHY.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
- PHY.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
- PHY.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
- PHY.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
- PHY.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES [Apply the following to each content standard.]

PHY.2 Develop abilities in science. HS-ETS1

- PHY.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
- PHY.2.2 Understand and utilize the scientific method of problem solving.
- PHY.2.3 Utilize the principles and methodologies of cooperative learning.

PHY.3 Be able to apply science knowledge and skills to a variety of purposes. HS-ETS1

- PHY.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
- PHY.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
- PHY.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
- PHY.3.4 Conduct research in the content area.
- PHY.3.5 Engage in various uses of technology.

COURSE CONTENT: Mechanics, Thermodynamics, Sound and Electromagnetic Waves, Electricity and Magnetism, Nuclear Physics [Understand, explore, analyze, apply.]

PHY.4 Be able to understand relationships between matter and energy and how they interact.

- PHY.4.1 Recognize God as the Designer and Creator of our physical world and its governing laws.
- PHY.4.2 Identify the fundamental properties and laws of mechanics. HS-PS2-1, 2-2, 2-3, 2-4, 3-1, 3-2, 3-3
- PHY.4.3 Define the properties and laws of thermodynamics. HS-PS3-1, 3-2, 3-3, 3-4
- PHY.4.4 Demonstrate an understanding of sound and electromagnetic wave principles. HS-PS4-1, 4-3, 4-4, 4-5
- PHY.4.5 Describe the fundamental properties of electricity and magnetism. HS-PS2-4, 2-5, 3-1, 3-2, 3-3, 3-5
- PHY.4.6 Understand the basic concepts of nuclear physics. HS-PS1-8

PHY.5 Be able to safely explore physics concepts.

- PHY.5.1 Test the properties and laws of mechanics (Newton's laws, work, power, velocity, energy, etc.). HS-PS2-1, 2-2, 2-3, 2-4, 3-1, 3-2, 3-3
- PHY.5.2 Explore the properties and laws of thermodynamics (laws, heat energy). HS-PS3-1, 3-2, 3-3, 3-4
- PHY.5.3 Investigate the properties of sound and electromagnetic waves (waves, optics, etc.). HS-PS3-3, 4-1, 4-3, 4-4, 4-5
- PHY.5.4 Examine the principles of electricity and magnetism (circuits, Ohm's law, forces, charges, fields). HS-PS2-4, 2-5, 3-1, 3-2, 3-3, 3-5
- PHY.5.5 Research the principles of nuclear physics (quantum theory, radioactivity, dating methods, etc.). HS-PS1-8

PHY.6 Be able to analyze physics data.

- PHY.6.1 Predict the outcome of motion and force problems using the principles of mechanics. HS-PS2-1, 2-2, 2-3, 2-4, 3-1, 3-2, 3-3
- PHY.6.2 Correlate changes in energy to the laws of thermodynamics. HS-PS3-1, 3-2, 3-3, 3-4
- PHY.6.3 Evaluate the conditions and factors which affect sound and electromagnetic waves. HS-PS3-3, 4-1, 4-3, 4-4, 4-5
- PHY.6.4 Analyze various electrical circuits. HS-PS2-4, 2-5
- PHY.6.5 Interpret the results of nuclear research. HS-PS1-8

PHY.7 Be able to apply principles of physics to health, life, and the physical environment.

- PHY.7.1 Strengthen belief in God as Designer and Creator by applying the laws of physics.
- PHY.7.2 Utilize the concepts of physics to improve lifestyle choices. HS-PS4-2, 4-5
- PHY.7.3 Apply the study of physics to issues regarding nuclear energy. HS-PS1-8

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