Course: Earth Science
Instructor: Mr. David A. Kren
Textbook: *Earth Science*, McDougal Littell. 2003

Course Purpose: "In the beginning, God created the heavens and the earth". These are the first words found in Scripture. John 17:17 says "Sanctify (being made holy by God's word) them by the truth, your word is truth." and it is by the Holy Spirit we have faith and accept these words as truth. This will serve as the foundation for the purpose of this course, which is to allow the students to closely examine and explore the many facets of the earth and the heavens, and in doing so, discovering the awesome creative power and knowledge of God. Students will see how wonderfully natural things illustrate a created world and will understand their place within it to make informed, God pleasing choices about using, conserving, and living on the earth.

Course Outcomes:

1. ***Hebrews 11 states "Now faith is being sure of what we hope for and certain of what we do not see. By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible." Understanding that it is through faith that we know the truth, students will "be prepared to give an answer to everyone who asks you to give a reason for the hope that you have." 1Pet 3:15.***
2. ***Explain the importance of understanding and studying Earth Science for their personal lives.***
3. ***Demonstrate knowledge of the Creator, by highlighting words from scripture, which shows they know what it is they believe.***
4. ***Analyze and critique current scientific ideas about the origin of the earth and the universe.***
5. ***Describe and analyze the major characteristics and properties of the earth with the aid of lab equipment, specimens, and technology.***
6. ***Identify and explain the forces of nature that impact the earth and relate the result of these forces to past, present and future phenomena.***
7. ***Explain the significance of the earth being classified as the only water planet.***
8. ***Describe the significance of the Earth's place in the universe in relation to other celestial bodies, by explaining such things as seasonal differences and time relationships.***
9. ***Chart and describe global characteristics such as temperature, pressure, and precipitation, by analyzing and interpreting data from a variety of media sources.***
10. ***Explain the effect of the hydrologic cycle, earth-sun relationship, and axis tilt on daily weather conditions and their impact on global climactic events.***

Course Goals:

1. *By the grace of God each student will rely more confidently on God's forgiving grace in Christ and grow in Christ-like love in all human relationships.*
2. *In a world in which evolution and the absence of God are now proclaimed as the norm in science and in life, students will be able to, in their own God pleasing way, uphold the truths of scripture when faced with the opportunities to do so.*
3. *Students will appreciate more potently the power and wisdom of their Lord in creating the universe and things with it and the world, seeing how wonderfully everything works within and with other parts of His creation.*

<u>Course Outline</u>: This is a college prep course which includes all the standard topics and concepts required of a high school class. The Bible will serve as our authoritative text with the *Earth Science* text being our topical guide. The main topics are Creation, Geology, Meteorology, Oceanography, Astronomy, and Weathering and Erosion. The course will cover these topics by students completing the following units:

<u>Unit One</u>: <u>Creation of the Earth</u> is a look at the truth of Creation and comparing it to alternative ideas as to how it all began.

1. ***Genesis 1-2:3****. Describe what God did on each day 1-7, and explain the significance of the following not only for when he created them, but even their significance for us today.*
    a. *List the statements or phrases God uses more than once in the account and describe why they are important.*
    b. *Examine the order in which He created things and describe the importance of the order.*
    c. *Explain the day of rest and its meaning in at least two ways.*
    d. *Examine science materials developed by creation believing scientists and build a list of sources for future referral.*
2. ***The theory of Evolution and the geologic column.***
    a. *Describe the basic tenets of the evolutionary theory along with identifying which specific parts of scripture the theory is trying to combat.*
    b. *Describe the ethical and moral issues at stake because of how "successful" the devil has been in developing this theory.*
    c. *Examine current popular views of the origin of the universe and compare them to the Biblical account.*
    d. *Explore the problems that exist with the geological column as it currently is understood.*
    e. *Study and explain a variety of ways dating methods are used to age the earth and critique their reliability.*

Textbook: 646-681
Number of days: 10
School Outcomes: 1-6
Department Outcomes: 1, 2, 4
State Standards: A.12.2, 4; B.12.1, 3; C.12.1-7; D.12.7-9, 11; E.12.3, 5; G.12.1, 2; H.12.3, 4

<u>Unit Two: What is Earth science</u>? This gives the students an overview of the main topics of study as well as the characteristics of the planet we call home.

1. ***Earth as a system***
    a. *Describe how scientists view Earth today.*
    b. *Compare and contrast open and closed systems.*
    c. *Explain the significance of Earth as a closed system.*
    d. *Describe the four spheres of the earth and explain how they interact and change.*
    e. *Describe the characteristics of water, carbon, and energy cycles.*
2. ***The nature of science****.*
    a. *Describe the qualities of scientific thinking.*
    b. *Explain the importance of scientific inquiry and peer review.*

c. *Explain the differences between a hypothesis, a theory, and a law.*
d. *Describe simple and complex tools that Earth scientists use.*

3. ***Earth's structure and motion.***
   a. *Describe Earth's size and shape and the arrangement of its layers.*
   b. *List three sources of Earth's internal heat.*
   c. *Give evidences of Earth's rotation and revolution.*
   d. *Describe Earth's path and rate of revolution and explain why seasons occur.*
   e. *Calculate the circumference of the earth using Eratosthenes' method.*
   f. *Calculate the altitude of the sun at noon for any day and location on Earth.*

Textbook: 1-41; 68-87.
Number of days: 12
School Outcomes: 1-6
Department Outcomes: 1-4
State Standards: A.12.2, 4; B.12.1, 3; C.12.1-7; D.12.7-9, 11; E.12.3, 5; G.12.1, 2; H.12.3, 4

<u>Unit 3: Geology</u>. This allows the student to examine the solid materials God used to create the earth, such as rocks and minerals.

1. ***From atoms to minerals***
   a. *Identify the characteristics of matter.*
   b. *Describe the three types of chemical bonds.*
   c. *Identify major mineral physical characteristics and factors that influence their formation.*
   d. *Identify rock –forming minerals by inspection, using physical properties such as color, luster, and crystal shape.*
   e. *Identify rock-forming minerals by using simple tests that identify both physical and chemical properties, for example, streak, specific gravity and the acid test.*
   f. *Describe the properties and tests used to identify and classify common minerals.*
2. ***Rocks***
   a. *Differentiate among the three major rock types.*
   b. *Compare and contrast the processes in the rock cycle.*
   c. *Distinguish between intrusive and extrusive igneous rocks and how they form.*
   d. *Distinguish among the three types of sedimentary rocks and how they form.*
   e. *Explain the processes involved in the formation of metamorphic rocks.*
   f. *Differentiate among the different kinds of metamorphic rocks.*
   g. *Define uniformitarianism and how it contradicts the truth.*

Textbook: 88-141
Number of days: 25
School Outcomes: 1-6
Department Outcomes: 1-4
State Standards: A.12.2, 4; B.12.1, 3; C.12.1-7; D.12.1-5; E.12.2-5; H.12.1

<u>Unit 4: Cartography</u>. Scientists have made models and maps of the Earth for years. This unit examines the history of map making and looks at current methods as well.

1. ***Models of the Earth***.
    a. *Compare and contrast three types of map projections.*
    b. *Use latitude and longitude to describe a location.*
    c. *Relate the history of mapmaking.*
    d. *Describe the roles of satellites and computers in making and using maps.*
    e. *Explain how topographic maps use contour lines to show elevation.*
    f. *Create your own map with a legend, symbols and proper scale.*

Textbook: 42-65
Number of days: 10
School Outcomes: 1-6
Department Outcomes: 2-4
State Standards: B.12.1; G.12.1, 2;

<u>Unit 5: Meteorology</u>. The heavens declare the glory of God. The closest part of the heavens to us is our sky. Weather patterns and composition of the atmosphere are the major topics of study.

1. ***Atmosphere***
    a. *Describe the composition and zones of the atmosphere.*
    b. *Describe how energy from the sun moves through the atmosphere by radiation, conduction and convection.*
    c. *Analyze the Earth's heat budget.*
    d. *Identify the factors that cause the intensity of insolation to vary from place to place.*
    e. *Analyze a temperature map.*
    f. *Discuss how human activities can affect the atmosphere.*
    g. *Compare and contrast acid rain, smog, ozone depletion, and global warming.*
2. ***Water in the atmosphere***.
    a. *Describe the three states in which water can exist in the atmosphere.*
    b. *Explain how air temperature affects the amount of water vapor air can contain.*
    c. *Analyze how condensation occurs in the atmosphere.*
    d. *Describe the three basic cloud forms.*
    e. *Compare and contrast how precipitation forms in warm clouds and in cold clouds.*
    f. *Describe how rising air produces condensation.*
3. ***The atmosphere in motion***.
    a. *Define air pressure and describe how changes in elevation, temperature, and humidity affect air pressure.*
    b. *Describe the Coriolis Effect and explain how it affects wind direction along with friction and pressure gradient.*
    c. *Identify factors that affect global wind patterns.*
    d. *Explain the circulation of se, land, mountain, and valley breezes.*
4. ***Weather.***
    a. *Compare and contrast different types of air masses.*
    b. *Describe the weather conditions associated with different types of fronts.*
    c. *Describe the life cycle of a mid-latitude low.*
    d. *Describe conditions necessary for thunderstorms and tornadoes to form.*
    e. *Describe the formation and effects of hurricanes, and the measures taken to mitigate their damage.*
    f. *Describe weather associated with a mid-latitude low in winter.*
    g. *Describe how weather forecasts are made.*

5. ***Climate***
    a. *Define climate and the factors that influence it.*
    b. *Describe Earth's major climate zones.*
    c. *Explain the causes of climate change.*

Textbook: 362-482
Number of days: 35
School Outcomes: 1-6
Department Outcomes: 1-4
State Standards: A.12.1, 3; B.12.4; C.12.1-7; D.12.7-9, 11; E.12.1, 2; G.12.1-4

Unit 6: Forces of Nature changing the Earth.

1. ***Weathering, Soil and Erosion***
    a. *Compare and contrast how Mechanical and Chemical weathering break down rocks*
    b. *Name three factors that affect weathering rates.*
    c. *Explain how soil forms.*
    d. *Describe soil composition and the factors that affect it.*
    e. *Give examples of mass movements.*
    f. *Describe the ways in which human activity threatens soil fertility and methods that can be employed to reduce soil erosion.*
2. ***Hydrology***
    a. *Describe the characteristics of a stream or river that affect its ability to erode sediment.*
    b. *Describe how streams transport and deposit sediments.*
    c. *Describe the formation of rapids and waterfalls.*
    d. *Explain what a floodplain is and why floods occur.*
    e. *Summarize natural and artificial methods of flood prevention and control.*
    f. *Explain how porosity and permeability affect the storage and movement of groundwater.*
    g. *Describe the water table and the features associated with it.*
    h. *Distinguish among artesian formations, hot springs, geysers, and fumaroles.*
    i. *List factors that affect a water budget. Calculate the yearly water budget for a given location.*
    j. *Explain the presence of minerals in groundwater.*
    k. *Describe how groundwater deposits minerals.*
    l. *Explain how groundwater can become polluted.*
3. ***Glaciers***
    a. *Defend the evidence for glaciers covering much of Wisconsin at one point in Earth's recent history.*
    b. *Identify the locations of glaciers today.*
    c. *Describe how glaciers move and how they erode the land.*
    d. *Describe the various land deposits and geological formations typical of glacier movement and retreat.*
    e. *Distinguish between till and outwash.*
    f. *Explain the significance of the drift less area in Wisconsin.*
4. ***Plate tectonics***
    a. *Define what Plates are and explain the tectonic theory.*
    b. *Explain then how the theory of plate tectonics helps to predict the location of earthquakes and volcanoes.*
    c. *Discuss the differences among three types of plate boundaries.*

5. ***Volcanoes***
    a. *Analyze how magma forms as a result of plate motion and interaction.*
    b. *Explain why most plate boundaries are the sites of most volcanic activity.*
    c. *Compare the characteristics of magma and lava.*
    d. *Describe pyroclastic materials.*
    e. *Compare and contrast landforms that result form volcanic activity.*
6. ***Earthquakes***
    a. *Explain how most earthquakes result from strain that builds up along faults or near plate boundaries.*
    b. *Describe how energy released in an earthquake travels in waves.*
    c. *Explain how a seismograph is used to record earthquake waves and locate an earthquake's epicenter.*
    d. *Summarize how the magnitude of an earthquake is measured.*
    e. *Summarize earthquake hazards and the damage they can cause.*
    f. *Describe how a tsunami results from an earthquake.*
    g. *Describe how data from seismic waves are used to infer the structure of Earth's interior.*

Textbook: 254-337; 168-233
Number of days: 55
School Outcomes: 1-6
Department Outcomes: 1, 2, 4
State Standards: A.12.1-7; B.12.1, 3; C.12.1-7; D.12.1, 7-9, 11; E.12.1-5; G.12.1-5; H.12.1-7

<u>Unit 7: Oceanography</u>. The sizes of the oceans are incredible, so is their beauty. But there is so much more below the surface as well. The structure of the floor, the currents and chemical make-up of the water are major focal points. Dolphins and whales may live there, but we will leave the study of them to the biologists for now.

1. ***The water planet***
    a. *Contrast the densities of liquid water and ice.*
    b. *Explain how the polarity of water molecules affects the behavior of water.*
    c. *Describe the changes in water properties when it combines with ocean salts.*
    d. *Identify factors that affect salinity levels in the oceans.*
    e. *Describe the three temperature layers within the oceans.*
2. ***The ocean floor***
    a. *Describe the parts of the continental margin.*
    b. *Compare and contrast active and passive continental margins.*
    c. *Explain the origin of submarine canyons in two ways.*
    d. *Describe the features of the ocean basin.*
    e. *Identify three sources of ocean sediments.*
    f. *Explain why studying ocean sediment is important.*
3. ***The moving ocean***.
    a. *Describe the relationship between winds and surface currents.*
    b. *Describe patterns of different types of surface currents.*
    c. *Identify factors that impact the density of ocean water.*

Textbook: 486-540
Number of days: 10
School Outcomes: 2-6
Department Outcomes: 2, 3, 4
State Standards: A.12.3, 7; B.12.4; D.12.7-9; E.12.1, 2; G.12.1-3;

<u>Unit 8: Astronomy</u>. The book of Psalms is filed with praises for the beauty and glory of God shown in the heavens above. The section is a survey of some of the things God created in the vastness of space.

1. ***Earth's moon***
    a. *Explain how the moon and the sun affect the tides.*
    b. *Compare and contrast tidal ranges of different bodies of water.*
    c. *Describe the features and properties of the moon.*
    d. *Describe lunar motions and explain the reasons why the moon goes through its phases.*
    e. *Analyze how the Earth-moon-sun geometry causes lunar and solar eclipses.*
2. ***The Sun and the Solar System***.
    a. *Explain the structure of the sun as its energy source.*
    b. *Describe the effects of sunspots, solar wind, and magnetic storms on Earth.*
    c. *Describe the early models of movements of planets and stars.*
    d. *Explain Newton's Law of Gravitation.*
    e. *Define Kepler's three laws of planetary motion.*
3. ***The Planets and the Solar System***
    a. *Describe the characteristics of all the planets.*
    b. *Describe the main satellites in the solar system*
    c. *Explain the orbiting patterns of Neptune, Pluto, and Charon.*
4. ***Stars and Galaxies***.
    a. *Explain the techniques for analyzing light to obtain information about star motions.*
    b. *Explain why the positions of constellations in the sky change with the seasons.*
    c. *Identify main northern sky constellations and the major stars within them.*
    d. *List and explain the three main units scientists use to measure distances to stars.*
    e. *Describe characteristics of stars like mass, size, temperature, color, and luminosity.*
    f. *Describe some unique features of the universe such as different galaxies, variable stars, pulsars, supernovas, comets, and black holes.*

Textbook: 541-643
Number of days: 15
School Outcomes: 1-6
Department Outcomes: 1-4
State Standards: A.12.1-7; B.12.1-5; C.12.1-7; D.12.1; E.12.1-5; F.12.5,6;G.12.1-5; H.12.1,3

<u>Unit 9: Environmental Issues</u>. As caretakers of Earth, we need to be aware of the negative and positive impact we can have on it.

1. ***Resources and the Environment***.
    a. *Distinguish between renewable and nonrenewable resources.*
    b. *Describe how humans use renewable and nonrenewable energy resources to meet their needs and explain how the use of these impacts the environment.*
    c. *Explain how humans can slow the depletion of resources.*
    d. *Describe the cause of and justify the severity of such environmental issues such as global warming, ozone depletion, and acid rain.*

Textbook: 142-167
Number of days: 8
School Outcomes: 1-6
Department Outcomes: 1-4
State Standards: A.12.1, 5; C.12.1-7; E.12.1; G.12.1-5; H.12.1-7

Wisconsin Lutheran High School

<u>School Outcomes</u>: This course will follow the WLHS Mission Statement and objectives and every unit is designed to produce students who have demonstrated:

1. Fruits of faith in Jesus through Christian love service and witness. *As we learn about how God created us, why He created us, and how much he loves us, and how we are reminded by examining just how wonderful livings things work internally and interactively with each other and the world around them, it should provide for each student the avenue to grow in their relationship with their Lord and provide opportunity to express that love to others, and the incredible power and wisdom their God possesses.*

2. Perceptive thinking which integrates experience, research, and reason with God's will as revealed in His Holy Word in critical analysis, problem solving, and decision making. *All of the topics we discuss and concepts we work with and examine each one will be done so through the truth of scripture. As we examine what we see around us we will also explore what scientists may try to explain away through the "eyes" of chance, which is evolution. As we use the tools of science we shall do so to the glory of God.*

3. Effective communication skills by listening, sharing their thoughts, feelings, faith, and ideas; and working cooperatively with others in family, school, church, work, and community settings. *Lab work that we do in this class will provide each student an opportunity to work collaboratively on a topic and process with someone else, depending on each other's work and ideas to solve problems, and communicate results clearly through a wide variety of media.*

4. The knowledge, skills, and attitudes necessary to become self-initiating and self-directing life-long learners. *The specific demands of this class, such as reading from the text, listening and taking notes during lectures, and attending every session requires the student to take a proactive approach to learning. In order to be successful in this course they will need to realize a lot of the responsibility for the material does lie on them. This experience will then provide for them a model to follow in the years ahead.*

5. The ability to recognize themselves as individually formed creatures of God and to use their unique, God-given blessings to contribute to the quality of life in a complex global society. *By learning specifically about how God knit them together in their mother's womb, and having the opportunity to do some in depth study about how their own body works, each student should be able to embrace the similarities within each one of us, a similarity that demonstrates God's design. This then should also give each one of them the opportunity to again embrace the idea that God made each one of us unique, and has a specific plan for each one of us.*

6. The verbal, quantitative, scientific, and technological literacy necessary for a productive, meaningful life. *We live now in the 21st century. Students will use a wide variety of technological tools to enhance learning, and hopefully keep up with the fast paced movement of today's scientific advances and advantages.*

Wisconsin Lutheran High School Science Department Outcomes

Unit 1: Creation of the Earth

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 2: What is Earth Science?

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 3: Geology

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

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4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 4: Cartography

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 5: Meteorology

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 6: Forces at Work Changing the Earth.

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 7: Oceanography

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 8: Astronomy

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Unit 9: Environmental Issues

1. Students will be God centered thinkers who

1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology.

1.2 Apply God's Word as it relates to science issues

2. Students will be effective communicators who

2.1 Express an understanding of the major concepts and principles of science and related technology.

2.2 Analyze opinions and statements set forth by others.

3. Students will be innovative problem solvers who

3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations.

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed decisions.

4. Students will be self directed learners who

4.1 Research, evaluate, and use scientific information from a variety of sources.

4.2 Contribute both independently and cooperatively with their peers.

4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society.

Wisconsin State High School Science Standards

Unit 1: Creation of the Earth.

A.12.2 Show* how conflicting assumptions about science themes* lead to different opinions and decisions about evolution*, health, population, longevity, education, and use of resources, and show* how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future.

A.12.4 Construct* arguments that show* how conflicting models* and explanations* of events can start with similar evidence*.

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

B.12.3 Relate* the major themes* of science to human progress in understanding science and the world.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining* the meaning and implications of the results, answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

D.12.7 Qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically.

D.12.8 Understand* the forces of gravitation, the electromagnetic force, intermolecular force, and explain* their impact on the universal system.

D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave.

D.12.11 Using the science themes*, explain* common occurrences in the physical world.

E. 12.3 Using the science themes*, describe* theories of the origins and evolution of the universe and solar system, including the earth system* as a part of the solar system, and relate these theories and their implications to geologic time on earth.

E. 12.5 Using science themes*, understand* that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

H. 12.3 Show * how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology.

H. 12.4 Advocate a solution or combination of solutions to a problem in science or technology.

Unit 2: What is Earth Science?

A.12.2 Show* how conflicting assumptions about science themes* lead to different opinions and decisions about evolution*, health, population, longevity, education, and use of resources, and show* how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future.

A.12.4 Construct* arguments that show* how conflicting models* and explanations* of events can start with similar evidence*.

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

B.12.3 Relate* the major themes* of science to human progress in understanding science and the world.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining* the meaning and implications of the results, answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

D.12.7 Qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically.

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D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave.

D.12.11 Using the science themes*, explain* common occurrences in the physical world.

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H. 12.3 Show * how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology.

H. 12.4 Advocate a solution or combination of solutions to a problem in science or technology.

Unit 3: Geology.

A.12.2 Show* how conflicting assumptions about science themes* lead to different opinions and decisions about evolution*, health, population, longevity, education, and use of resources, and show* how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future.

A.12.4 Construct* arguments that show* how conflicting models* and explanations* of events can start with similar evidence*.

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

B.12.3 Relate* the major themes* of science to human progress in understanding science and the world.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

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C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining* the meaning and implications of the results, answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

D.12.1 Describe* atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions*.

D.12.2 Explain* the forces that hold the atom together and illustrate* how nuclear interactions* change the atom.

D.12.3 Explain* exchanges of energy* in chemical interactions* and exchange of mass and energy in atomic/nuclear reactions.

D.12.4 Explain* how substances, both simple and complex, interact* with one another to produce new substances. D.12.5 Identify* patterns in chemical and physical properties and use them to predict* likely chemical and physical changes and interactions.

D.12.5 Identify* patterns in chemical and physical properties and use them to predict* likely chemical and physical changes and interactions.

E. 12.2 Analyze* the geochemical and physical cycles of the earth and use them to describe* movements of matter.

E. 12.3 Using the science themes*, describe* theories of the origins and evolution of the universe and solar system, including the earth system* as a part of the solar system, and relate these theories and their implications to geologic time on earth.

E. 12.4 Analyze* the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain* the consequences to the environment.

E. 12.5 Using science themes*, understand* that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin.

H. 12.1 Using the science themes*and knowledge of the earth and space, life and environmental, and physical sciences, analyze* the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region.

Unit 4: Cartography

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

Unit 5: Meteorology.

A.12.1 Apply* the underlying themes* of science to develop defensible visions of the future.

A.12.3 Give examples that show* how partial systems*, models*, and explanations* are used to give quick and reasonable solutions that are accurate enough for basic needs.

B.12.4 Show* how basic research and applied research contribute to new discoveries, inventions, and applications.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

D.12.7 Qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically.

D.12.8 Understand* the forces of gravitation, the electromagnetic force, intermolecular force, and explain* their impact on the universal system.

D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave.

D.12.11 Using the science themes*, explain* common occurrences in the physical world.

E. 12.1 Using the science themes*, distinguish between internal energies* (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show* how these sources of energy have an impact on those systems.

E. 12.2 Analyze* the geochemical and physical cycles of the earth and use them to describe* movements of matter.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

G. 12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and community.

G. 12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home

Unit 6: Forces at Work changing the Earth.

A.12.1 Apply* the underlying themes* of science to develop defensible visions of the future.

A.12.2 Show* how conflicting assumptions about science themes* lead to different opinions and decisions about evolution*, health, population, longevity, education, and use of resources, and show* how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future.

A.12.3 Give examples that show* how partial systems*, models*, and explanations* are used to give quick and reasonable solutions that are accurate enough for basic needs.

A.12.4 Construct* arguments that show* how conflicting models* and explanations* of events can start with similar evidence*.

A. 12.5 Show* how the ideas and themes* of science can be used to make real life decisions about careers, work places, life-styles, and use of resources.

A.12.6 Identify* and, using evidence* learned or discovered, replace inaccurate personal models* and explanations* of science-related events.

A.12.7 Re-examine the evidence* and reasoning that led to conclusions drawn from investigations*, using the science themes*.

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

B.12.3 Relate* the major themes* of science to human progress in understanding science and the world.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

D.12.1 Describe* atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions*.

D.12.7 qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically.

D.12.8 Understand* the forces of gravitation, the electromagnetic force, intermolecular force, and explain* their impact on the universal system.

D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave.

D.12.11 Using the science themes*, explain* common occurrences in the physical world.

E. 12.1 Using the science themes*, distinguish between internal energies* (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show* how these sources of energy have an impact on those systems.

E. 12.2 Analyze* the geochemical and physical cycles of the earth and use them to describe* movements of matter.

E. 12.3 Using the science themes*, describe* theories of the origins and evolution of the universe and solar system, including the earth system* as a part of the solar system, and relate these theories and their implications to geologic time on earth.

E. 12.4 Analyze* the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain* the consequences to the environment.

E. 12.5 Using science themes*, understand* that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

G. 12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and community.

G. 12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home

G. 12.5 Choose a specific problem in our society, identify* alternative scientific or technological solutions to that problem and argue its merits.

H. 12.1 Using the science themes*and knowledge of the earth and space, life and environmental, and physical sciences, analyze* the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region.

H. 12.2 Evaluate* proposed policy recommendations (local, state, and/or national) in science and technology for validity, evidence, reasoning, and implications, both short and long-term.

H. 12.3 Show * how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology.

H. 12.4 Advocate a solution or combination of solutions to a problem in science or technology.

H. 12.5 Investigate* how current plans or proposals concerning resource management, scientific knowledge, or technological development will have an impact on the environment, ecology, and quality of life in a community or region.

H.12.6 Evaluate* data and sources of information when using scientific information to make decisions.

H. 12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning.

Unit 7: Oceanography.

A.12.3 Give examples that show* how partial systems*, models*, and explanations* are used to give quick and reasonable solutions that are accurate enough for basic needs.

A.12.7 Re-examine the evidence* and reasoning that led to conclusions drawn from investigations*, using the science themes*.

B.12.4 Show* how basic research and applied research contribute to new discoveries, inventions, and applications.

D.12.7 qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically.

D.12.8 Understand* the forces of gravitation, the electromagnetic force, intermolecular force, and explain* their impact on the universal system.

D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave.

E. 12.1 Using the science themes*, distinguish between internal energies* (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show* how these sources of energy have an impact on those systems.

E. 12.2 Analyze* the geochemical and physical cycles of the earth and use them to describe* movements of matter.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

G. 12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and community.

Unit 8: Astronomy.

A.12.1 Apply* the underlying themes* of science to develop defensible visions of the future.

A.12.2 Show* how conflicting assumptions about science themes* lead to different opinions and decisions about evolution*, health, population, longevity, education, and use of resources, and show* how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future.

A.12.3 Give examples that show* how partial systems*, models*, and explanations* are used to give quick and reasonable solutions that are accurate enough for basic needs.

A.12.4 Construct* arguments that show* how conflicting models* and explanations* of events can start with similar evidence*.

A. 12.5 Show* how the ideas and themes* of science can be used to make real life decisions about careers, work places, life-styles, and use of resources.

A.12.6 Identify* and, using evidence* learned or discovered, replace inaccurate personal models* and explanations* of science-related events.

A.12.7 Re-examine the evidence* and reasoning that led to conclusions drawn from investigations*, using the science themes*.

B.12.1 Show* how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences.

B.12.2 Identify* the cultural conditions that are usually present during great periods of discovery, scientific development, and invention.

B.12.3 Relate* the major themes* of science to human progress in understanding science and the world.

B.12.4 Show* how basic research and applied research contribute to new discoveries, inventions, and applications.

B.12.5 Explain* how science is based on assumptions about the natural world and themes* that describe the natural world.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

E. 12.1 Using the science themes*, distinguish between internal energies* (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show* how these sources of energy have an impact on those systems.

E. 12.2 Analyze* the geochemical and physical cycles of the earth and use them to describe* movements of matter.

E. 12.3 Using the science themes*, describe* theories of the origins and evolution of the universe and solar system, including the earth system* as a part of the solar system, and relate these theories and their implications to geologic time on earth.

E. 12.4 Analyze* the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain* the consequences to the environment.

E. 12.5 Using science themes*, understand* that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin.

F. 12.5 Understand* the theory of evolution*, natural selection, and biological classification.

F. 12.6 Using the concepts of evolution* and heredity, account for changes* in species and the diversity of species, include the influence of these changes on science, e.g. breeding of plants or animals.

G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

G. 12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and community.

G. 12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home

G. 12.5 Choose a specific problem in our society, identify* alternative scientific or technological solutions to that problem and argue its merits.

H. 12.1 Using the science themes*and knowledge of the earth and space, life and environmental, and physical sciences, analyze* the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region.

H. 12.3 Show * how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology.

Unit 9: Environmental Issues.

A.12.1 Apply* the underlying themes* of science to develop defensible visions of the future.

A. 12.5 Show* how the ideas and themes* of science can be used to make real life decisions about careers, work places, life-styles, and use of resources.

C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations.

C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions.

C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements.

C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data.

C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*.

C. 12.6 Present the results of investigations* to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand.

C. 12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design.

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G. 12.1 Identify* personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered.

G. 12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences.

G. 12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and community.

G. 12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home

G. 12.5 Choose a specific problem in our society, identify* alternative scientific or technological solutions to that problem and argue its merits.

H. 12.1 Using the science themes*and knowledge of the earth and space, life and environmental, and physical sciences, analyze* the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region.

H. 12.2 Evaluate* proposed policy recommendations (local, state, and/or national) in science and technology for validity, evidence, reasoning, and implications, both short and long-term.

H. 12.3 Show * how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology.

H. 12.4 Advocate a solution or combination of solutions to a problem in science or technology.

H. 12.5 Investigate* how current plans or proposals concerning resource management, scientific knowledge, or technological development will have an impact on the environment, ecology, and quality of life in a community or region.

H.12.6 Evaluate* data and sources of information when using scientific information to make decisions.

H. 12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning.