Biology Syllabus
Roger Festerling
2011-2012

Text: Biology: The Dynamics of Life, Glencoe, 2007

Purpose : The purpose of this course is to help the student understand, appreciate, and utilize God's living creation of plants, animals and man to glorify His name. Students will do this by making God-pleasing decisions that will benefit the environment, as well as all people on this earth. As students learn how incredibly complex life is, and how God designed and ordered it to work together, they will come to know the importance of their humble, yet awesome place on earth. They will also see their important role of those that.....rule and subdue the earth..Gen 1:28.

Course Outcomes: The students will:

- Examine the Evolution and Creation Models
- Apply the principles of the scientific method to problems dealing with the living world
- Examine a cell to appraise its importance as the basic unit of life
- Discover organic chemistry as an integral basis for life functions
- Apply the principles of genetics to the continuity and diversity of life
- Assess current scientific discoveries in the light of science, Scripture and Christian ethics
- Utilize the tools of taxonomy to organize living organisms
- Compare and contrast: the diversity of structures, life histories, characteristics, economic influences, ecological influence, and habitats of organisms of the nine phyla
- Differentiate between the biological processes that illustrate a linear flow of energy and cyclical flow of matter
- Incorporate knowledge about life processes and nutritional needs for our growth and development as we study the human anatomy

Course Materials: Three Ring binder, loose-leaf paper, reinforcement rings for all papers, highlighter, pen/pencil, Student Planner, Textbook

Unit I : In The Beginning

- We look at the tools needed to see the very smallest parts of life, especially the compound microscope, through lecture, and a 6 day sequential program of microscopy
- Using Genesis1: 1-31 we will understand where the study of biology gets its "marching orders"
- Through discussion we will understand the basic tenets of evolution
- The scientific method will be applied to several common student problems and then applied to a biology application

- In discovery we will learn the 7 characteristics of living organisms and the 5 needs of all living things.

  - Textbook pp2-49
  - Number of days 10
  - School outcomes 2,3,6
  - Department Outcomes

    - 1.1 Utilize scripture as a means of evaluating Sci discoveries and technology
    - 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 choices.
    - 4.1 Research, evaluate and use scientific information from a variety of sources

Unit II: God's Great Outdoors First-hand

- Analyze(graph, measure, observe) a given section of the Outdoor Classroom(O.C.)
- Plot on the graph all trees bigger than 6 cm.
- Number all of the trees that have been plotted
- Identify all of the species of trees plotted. Formal report due.
- Begin the "Wall of Fame", a collection of correctly identified species in the O.C.
- Lecture of Chapter 3 and then superimpose all the themes and concepts as they can be applied to the O.C. ex. What is the overriding population in the O.C. prairie?

  - Textbook pages 51 - 81
  - Number of days 8
  - School Outcomes 2,3,4,6
  - Department Outcomes

    - 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 choices
    - 4.1 Research, evaluate and use scientific information from a variety of sources
    - 4.2 Contribute both independently and cooperatively with their peers

Unit III : God's Organism Distribution and Our Interaction

- God's created world is one huge place, filled with unnumbered organisms, acting in harmony, keeping ecological homeostasis.
- In group work the students will adopt a world biome and report to the class, including the who, what, where, and physical parameters that identify it.Formal report due.
- Understand how God planned for our physical world to cleanse itself from pollutants, to replant itself, and to return to dust the organisms that die.
- Using fruit flies we will understand population as it competes for resources and apply this to human populations
- We will all evaluate by survey our attitudes toward the natural resources of our world

  - Textbook pages 83 - 155
  - Number of days 15
  - School Outcomes 2,3,4,5,6
  - Department Outcomes

    - 1.2 Apply God's Word as it relates to science issues
    - 2.2 Analyze opinions and statements set forth by others
    - 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 choices.
    - 4.2 Contribute both independently of and cooperatively with their peers

Unit IV. : The Cell...What a Cool Way God Has to Begin Every Living Thing

- We first must go back to the building blocks of matter - atoms and such.
- We model the structure of atoms and then segue into molecules and further see how these build a cell
- We look at the tools needed to see the very smallest parts of life, especially the compound microscope, through lecture, and a five day sequential program of microscopy
- A three-dimensional cell will be made by each student, with explanation
- Several models will be made to understand the semi-permeable membrane of the cells
- The egg and several solutions will be used to show the hypo, hyper, and iso, -tonic environments that cells can find themselves in. Formal report due.
- Through growing plants we will see how photosynthesis works.

- Mitosis and meiosis the multiplier and reducer of cells..God's great plan.

- Textbook pages 158 - 281
- Number of days 40
- School Outcomes 2-6
- Department Outcomes

  - 1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology
  - 2.1 Express an understanding of the major concepts and principles of science and related technology
  - 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 choices.
  - 4.1 Research, evaluate and use scientific information from a variety of sources
  - 4.2 Contribute both independently of and cooperatively with their peers
  - 4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

Unit V : ....And Everything Was Created After Its Own Kind ...Genetics

- Genetics...nothing new..Jacob worked for Laban getting his wages by specialized breeding
- Mendel and meiosis – Understand and apply the laws of heredity to make predictions about the characteristics of offspring
- Manipulate models to understand the nucleic acids making up DNA and amino acids that they "code" for.
- Using our own "code" we will bake something and relate this to our cells making those amino acids.
- Patterns of Heredity – Compare and distinguish traits and mutations in inheritance
- Human Heredity – Describe human traits and relate how various traits can cause problems in humans
- DNA technology and genetic engineering is this a good thing or bad thing...what does God say about this?
- Bio-ethics – Discuss opinions from a Scriptural perspective concerning current and future ethics issues related to genetics, diseases, DNA, and the Human Genome Project

- Report on Scientists or technology that has some connection with Genetics or Biotechnology, formal report due

!Textbook pages 284- 393
!Number of days 18
!School Outcomes 1-6
!Department Outcomes

- 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
- 2.1 Express an understanding of the major concepts and principles of science and related technology
- 2.2 Analyze opinions and statements set forth by others
- 3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations
- 4.1 Research, evaluate and use scientific information from a variety of sources
- 4.2 Contribute both independently of and cooperatively with their peers
- 4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

Unit VI : The Evolution Model vs. The Creation Model

- We must understand the need for clarification of models
- We must get our facts straight
- Evolutionists are "stuck" because they have no god, therefore they must believe in evolution
- Man is the "crown" of creation a. made in God's image b. God used something
  c. God's very own breath brought Adam to life d. to rule the earth
  Fossil record supports creation
- Young earth evidence a disaster to evolutionists
- There are some strong evidences that point to a created universe

- Textbook pages, none, all supplementary notes
- Number of days -6
- S.O. 2,3,4,5
- Department outcomes

- 1.2 Apply God's Word as it relates to science issues
- 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
- 3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations
- 4.1 Research, evaluate and use scientific information from a variety of sources
- 4.2 Contribute both independently of and cooperatively with their peers

Unit VII : God's Ordered World, From the Smallest of Viruses to the Mightiest of Oak

- Because "life" didn't evolve we should expect to see many unrelated organisms divided into "kinds", with no breeding crossovers
- The world's scheme of classification points to a created earth
- Why viruses are not really living beings
- Bacteria is indeed alive, it reproduces and in this we have economic and health impacts on our society
- Protists, the simplest whole creatures, how they impact our society
- Fungi and its related species of mushrooms, decomposer, no chlorophyll
- Identify the edible from the uneatable fungi

!Textbook pages 480 - 579
!Number of days 13
!S.O. 2,3,4
!Department Outcomes

- 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 choices.
- 4.1 Research, evaluate and use scientific information from a variety of sources
- 4.2 Contribute both independently of and cooperatively with their peers

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

Unit VIII : Day 3 of Creation, "Let the Land bring Forth Every Green Plant"

- Not all plants are created equal, vascular, nonvascular
- Ferns, mosses and gymnosperms, the non-flowering plants
- Roots - must be there to absorb water and nutrients
- Stems - the transport system throughout the plant
- Leaves - the production center of the plant, making more than it needs, we share in the excess
- Flowers- not just for beauty, but necessary for procreation
- Hydroponics is the study of water culture

!Textbook pages 580 - 687
!Number of days 13
!S.O. 1-6
!Department Outcomes

- 1.1 Utilize Scripture as a means of evaluating scientific discoveries and technology
- 2.1 Express an understanding of the major concepts and principles of science and related technology
- 3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations

Unit IX : Day 5 and 6 ....all that creepeth on the earth, flies above it, "The Animal Kingdom"

- We compare and contrast the invertebrates 8 phyla
- students will use a dichotomous key to identify species
- We want to understand the niche each organism has been assigned by its Creator
- The vertebrates, one phylum, are the most familiar, the ones we see and can usually identify in a most general way
- Students will report on one of the hundreds of choices of inverts or verts, especially working on the niche and how it applies to the whole community, we look back to Unit II, formal report due
- Here we especially get to appreciate the variety of God's creation
- Hands on work with the animals in the greenhouse

- Textbook pages 688 - 929
- Number of days 18
- S.O. 1-6
- Department Outcomes

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

  - Apply God's Word as it relates to science issues
  - Express an understanding of the major concepts and principles of science and related technology
  - 2.2 Analyze opinions and statements set forth by others
  - 3.1 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 choices
  - 4.1 Research, evaluate and use scientific information from a variety of sources
  - 4.2 Contribute both independently of and cooperatively with their peers
  - 4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

Unit X :"The Crown of Creation" the Physiology of Man

- The study of our physiology sometimes uses animals to "see" what we are like inside
- The bird wing disarticulation and then articulation helps us see the structure of our skin and muscles
- Our real skeleton demonstration helps the students see inside themselves
- The food lab helps us to understand the nutritional benefits of some foods and the uselessness of others...this as we study our digestive system
- We try to see how our respiratory, circulatory and excretory systems were planned out by our Creator to work together
- By studying the nervous system we will understand why our essence is our brain, it is who we are, all expressions of all emotions come from this source
- God does not want our bodies to have to endure illegal drugs
- The greatest gift given to man and woman when married is the gift of sex, through discussion some of the falsehoods will be explored in a clinical way

- The development of a new human...the greatest expression of the continuation of God's blessings
- The dissection of a rat culminates the human physiology unit

- Textbook pages 930 - 1067
- Number of days 28
- S.O. 1-6
- Department Outcomes

  - 1.2 Apply God's Word as it relates to science issues
  - 2.2 Analyze opinions and statements set forth by others
  - 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 choices
  - 4.1 Research, evaluate and use scientific information from a variety of sources
  - 4.2 Contribute both independently of and cooperatively with their peers
  - 4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

Instructional Strategies

Classroom Decorum

Respect/Love for Their Lord Will Motivate Students to:
Respect their Instructors
Respect for their peers
Respect themselves

When all of the people in the classroom (students and teachers) live according to these three rules.....God will be glorified.

The Basis for Grades

Major tests, one per chapter 40% of quarter grade
Projects with written report count 20%
Lab Reports 15%
All quizzes 20%
Homework 5%

Late Work Guidelines

"Train up a child in the way he should go and when he is old
He will not depart from it Proverbs 22.6"

1. In school activity
    - You are responsible for getting the assignment from me, or someone reliable
    - It is to be handed in or corrected within two days or it will be considered *officially late*
2. Excused absence for any other reason
    - You will have one day, per excused absence to get the work in to me. Ex. Absent Monday, the work will be excused until Wednesday, it will be handed in on Wednesday. After that day it will be considered *officially late*

3. Work not done when assigned
    - Ex. Homework Assignment due, and not completed in time for class, it is *officially late.*
    - Major work required on a certain date, if the due date is missed, it is *officially late*, (note: major works have until 3:30 to be handed in.
    - Regarding major works: it must be handed in directly to me and not just laid on my desk; I must sign off on the work.

4. What happens when homework is handed in at the proper time for an excused absence?

    - It is corrected and given appropriate credit.

5. What happens to work that is officially late?
    - Homework: it will **be corrected**, and given a 50%
    - It can be handed in anytime during the quarter and given a 50%
    - **At the end of the quarter**(four days prior to that date), if not handed in it will become a **0%**
    - Major Work: it will be scanned for completeness and then given a grade between 50% and 0%

6. Tests and Quizzes
    - Quizzes can not be made up, this does not help or harm your grade

- Tests will be given back for perusal and then returned to me
- You may make up tests until four days before the end of a quarter
- If the test is not taken it will be recorded as a 0%

Appendix
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State Standards

Unit I: In The Beginning

A.12.6 Identify* and, using evidence* learned or discovered, replace inaccurate personal models* and explanations* of science-related events
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.12.4 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.12.2 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.12.7 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
F.12.5 Understand* the theory of evolution*, natural selection, and biological classification
F.12.6. Using 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
F.12.11 Investigate* how the complexity and organization* of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy* used to sustain an organism

Unit II: God's Great Outdoors

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
F.12.7 Investigate* how organisms both cooperate and compete in ecosystems
F.12.8 Using the science themes*, infer* changes in ecosystems prompted by the introduction of new species, environmental conditions, chemicals, and air, water, or earth pollution
F.12.9 Using the science themes*, investigate* energy* systems* (related to food chains) to show* how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism
F.12.10 Understand* the impact of energy* on organisms in living systems*
F.12.11 Investigate* how the complexity and organization* of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy* used to sustain an organism
G.12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the community
G.12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home
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
H.12.4 Advocate a solution or combination of solutions to a problem in science or technology
H.12.4 Advocate a solution or combination of solutions to a problem in science or technology
H.12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning

Unit III: God's Organism Distribution and Our Interaction

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.12.6 Identify* and, using evidence* learned or discovered, replace inaccurate personal models* and explanations* of science-related events
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.12.5 Explain* how science is based on assumptions about the natural world and themes* that describe the natural world
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*
G.12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences
H.12.1 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.12.4 Advocate a solution or combination of solutions to a problem in science or technology
H.12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning

Unit IV: The Cell... What a Cool Way God Has to Begin Every Living Thing
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
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.12.4 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.12.3 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*
D.12.1 Describe* atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions*
D12.2 Explain* the forces that hold the atom together and illustrate* how nuclear interactions* change the atom
F.12.1 Evaluate* the normal structures and the general and special functions* of cells in single-celled and multiple-celled organisms
F.12.2 Understand* how cells differentiate and how cells are regulated
G.12.2 Design, build, evaluate, and revise models* and explanations related to the earth and space, life and environmental, and physical sciences

Unit V: .....And Everything Was Created After Its Own Kind.....Genetics

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*
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

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.12.5 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
F.12.3 Explain* current scientific ideas and information about the molecular and genetic basis of heredity
F.12.4 State the relationships between functions* of the cell and functions of the organism as related to genetics and heredity
G.12.3 Analyze* the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the 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 it 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
H.12.4 Advocate a solution or combination of solutions to a problem in science or technology

Unit VI: The Evolution Model vs. The Creation Model

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

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
F.12.5 Understand* the theory of evolution*, natural selection, and biological classification
F.12.6. Using 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
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 VII: God's Ordered World, From the Smallest of Viruses to the Mightiest Oaks

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.12.3 Relate* the major themes* of science to human progress in understanding science and the world
B.12.5 Explain* how science is based on assumptions about the natural world and themes* that describe the natural world
F.12.7 Investigate* how organisms both cooperate and compete in ecosystems
F.12.9 Using the science themes*, investigate* energy* systems* (related to food chains) to show* how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism

Unit VIII: Day Three of creation,"Let the Land Bring Forth every Green Plant"

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*
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.12.6 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
F.12.8 Using the science themes*, infer* changes in ecosystems prompted by the introduction of new species, environmental conditions, chemicals, and air, water, or earth pollution
F.12.9 Using the science themes*, investigate* energy* systems* (related to food chains) to show* how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism
F.12.10 Understand* the impact of energy* on organisms in living systems*
F.12.11 Investigate* how the complexity and organization* of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy* used to sustain an organism
G.12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home
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

Unit IX: Days 5 and 6....All That Creepeth On the Earth, Flies Above It, The Animal Kingdom

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*

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.12.6 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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F.12.9 Using the science themes*, investigate* energy* systems* (related to food chains) to show* how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism
F.12.10 Understand* the impact of energy* on organisms in living systems*
F.12.11 Investigate* how the complexity and organization* of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy* used to sustain an organism
G.12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home
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

Unit X: "The Crown of Creation"- The Physiology of Man
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.12.5 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.12.2 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.12.5 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.12.7 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

F.12.12 Trace how the sensory and nervous systems* of various organisms react to the internal and external environment and transmit survival or learning stimuli to cause changes in behavior or responses
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.12.4 Show* how a major scientific or technological change has had an impact on work, leisure, or the home
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