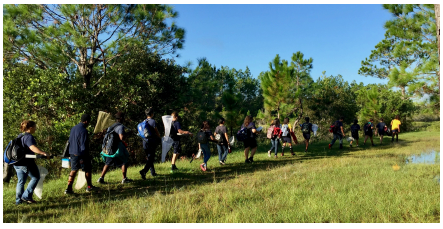
Biology I : Survey of Biological Concepts

The development of a balanced individual who is acquiring a sense of awe and wonder of creation and growing intellectually, socially and spiritually is the objective of a Christ-centered science education.

Classroom labs and group activities enhance the skills of problem solving, collaborating, and personal responsibility. Portfolios and oral reports build the necessary skills of communication, as well as, reinforcing learned concepts. Projects develop the skill of long-term time management. Field trips inspire the student with the grandeur of God's creative hand and allow them time to become intimate with Him.

Eagle Eye Inc., Natural History Museum, GLOBE, and Archaeology are programs that give opportunities for the students to experience community service



Personal Vitae - Gordon Davis

- Born Baltimore, January 24, 1947
- Forest Park High School 1965
- Southern Missionary College 1980 B.S. Biology
- Southern Adventist University 2004 M.S. Outdoor Education
- Served U.S. Army - Vietnam 1967 – 1968
- Married Carol Hartle, Children: Melissa, Ethan; Grandchildren: Carter, Ava
- Baptized May 1974 Seventh-day Adventist Church
- Pathfinder Leader, Deacon, Elder, Sabbath School Teacher

Teaching Assignments

- Kilgore Junior Academy in Charlotte, North Carolina, 1980 - 1983
- Walker Memorial Academy in Avon Park, Florida, 1983 - present

Community Service

- President of Kissimmee Valley Archaeological and Historical Conservancy
- Previous Recording Secretary of Florida Anthropological Society
- Former Board Member of Highlands County Lakes Association

Mission Trips

- Costa Rica 2004
- Costa Rica 2005
- Panama 2012
- Nicaragua 2014

Awards

- The Thomas and Violet Zapara Award of Recognition for Excellence in Teaching
- Southern Union Conference Innovative Teaching Award
- North American Lake Management Society Technical Excellence Award
- Alumni Awards Foundation Excellent in Teaching Award

Certificates of Appreciation

- The Florida Anthropological Society
- Highlands County Lakes Association
- University of Florida Lakewatch Program
- United States Environmental Protection Agency
- G.L.O.B.E. Program
- Office of the President of the United States Environmental Youth Award
- Office of the President of the United States Student Service Award

Pedagogy

Learning Methodology: A variety of differentiated learning strategies are utilized to enrich student learning through primary source documents, mini-lectures, discussion, debates, essays, simulations, research, videos, and technology, with emphasis on Project-Based Learning.
Project Based Learning (PBL): Project Based Learning is a method of instruction that actively engages all students in relevant 21st Century learning. Students need to become involved in meaningful thoughtful learning. They should be an integral part of their community. Authentic and relevant work engaged by the students creates lifelong learners and responsible citizenry. During daily 2-hour PBL project development, all students generate individual/group projects that demonstrate deep knowledge of cross-curricular themes linked to the NAD standards.

Assessment: Individual learning styles are acknowledged through a variety of assessments consisting of: Diagnostic (Identify current knowledge/skills), Formative (Feedback during the learning process), and Summative (Mastery). Assessments include: Quizzes, Tests, Exit Slips, Reflection Writing, Analog and Digital Portfolios, Public Performances, and Various Productions, Personal Developed Webpage.

NAD Standards

BIO1.2 Develop abilities in science.
BIO1.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).
BIO1.2.2 Understand and utilize the scientific method of problem solving.
BIO1.2.3 Utilize the principles and methodologies of cooperative learning.
BIO1.3 Be able to apply science knowledge and skills to a variety of purposes.
BIO1.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.
BIO1.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.
BIO1.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).
BIO1.3.4 Conduct research in the content area.
BIO1.3.5 Engage in various uses of technology.

Course Outline

1. Water-quality monitoring
    - Eagle Eye Inc.
        - Lake watch
        - Benthic Macro-invertebrates
        - Chemical Tests
        - Waste Management

BIO1.4.5 Comprehend the interdependence between organisms and their environment.
BIO1.6 Be able to analyze biological data.
BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem.

BIO1.6.5 Assess the environmental issues facing local ecosystems and earth's biomes.

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

BIO1.7.1 Develop a personal ethical value system regarding a world view of life.

BIO1.7.2 Utilize biological concepts to influence lifestyle choices.

BIO1.7.3 Minimize damage to the environment by practicing good stewardship.

2. Insects
   - Collection of 40 insects including 10 orders
   - Canoe trip to advance collection
   - Grasshopper Dissection Lab
   - Field Trip to Archbold Biological Research Station visit Dr. Mark Deyrup
   - Museum Board
   - Various Research

BIO1.4.4 Investigate taxonomy and the relationships among living organisms.

BIO1.4.5 Comprehend the interdependence between organisms and their environment.

BIO1.5.3 Classify, compare, and examine organisms.

BIO1.6.3 Evaluate the rationale for the current system of taxonomy.

BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem.

3. Cell Biology
   - Lab investigations of cell types
   - 3D modeling of cell
   - Various research portfolios
   - DNA modeling
   - Video of the Life of Rosaline Franklin "Photo 51"

BIO1.4.2 Demonstrate understanding of cellular structures and processes.

BIO1.5.1 Manipulate cellular models and samples.

BIO1.6.1 Compare and contrast cell diagrams and processes.

4. Biochemistry
   - Photosynthesis
   - Cellular Respiration

5. Microscopy
   - Parts
   - Care and Use
   - Lab investigations

6. Genetics
   - Sesame Street characters
   - YouTube video "Life of Gregor Mendel"
   - Lotto
   - Student genetic survey
   - Various research portfolios

BIO1.4.3 Describe the dynamics of genetics and biotechnology.

BIO1.6.2 Draw conclusions about genetic trends and the ethical ramifications of biotechnology.

7. Protozoans
    - Plankton tow
    - Lab investigations
    - Various research portfolios

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

BIO1.5.3 Classify, compare, and examine organisms.

BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem.

8. Bacteria
    - School bacteria survey
    - TED Talk "Bacteria Communication"
    - Various Research portfolios
    - BIO1.5 Be able to safely explore biological concepts using the scientific method.

BIO1.5.3 Classify, compare, and examine organisms.

BIO1.6 Be able to analyze biological data.

BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem.

9. Flowers
    - Flower Collection
    - Field trip to Preserves to enhance to the collection
    - Lab investigations
    - Portfolio Booklet
    - Various research portfolios

BIO1.5.3 Classify, compare, and examine organism

10. Human Sexuality
    - YouTube video Mark Gungor "Male and Female Brains"
    - Youtube video Mark Gungor "Yo Mama"
    - Various research portfolios

BIO1.7.1 Develop a personal ethical value system regarding a world view of life.

BIO1.7.2 Utilize biological concepts to influence lifestyle choices.

11. Marine biology
    - Shark Lab
    - Starfish Lab
    - Crayfish Lab
    - Seacamp Field Trip
    - Various research portfolios

BIO1.5.3 Classify, compare, and examine organisms.

BIO1.6.4 Determine how the relationships between organisms affect the balance of the ecosystem.

Field Trips

Vast open sky, ocean and beach or forest and river surround you. The spirit responds to this...tears fill your eyes...gladness floods your soul...thankful, grateful is the condition of your heart. This is wilderness. Where you and God meet.

In the wild places, when the world finally drains away, the spirit opens and the still small voice becomes...well, louder and clearer. We respond. It seems like home. Wanting a place and time like this. Breathe deep, feeling the peace overwhelm, exhale.

The conversation begins. Not knowing what to say at first. Just being thankful for being here. Thinking over all the stuff. Understanding what is important...Him. Making plans, commitments, setting goals, priorities, promises, hoping that this time...

It has been called a field trip, but it has become much more. We knew that such places would make a difference. Many years later, the testimonies will give us insight into the depth of the experience in the wilderness. How lives have been affected by the immersion into His classroom.

For now, we will be faithful. The scriptures are filled with God meeting His people...meeting them in the wild places. So we must be give our young people the opportunities to meet Him there, too.

Why wilderness, simple, no distractions. Supersaturation...total immersion into Him. Trees, birds, wind, surrounded by His presence, clearly felt...the tonic of wildness.

BIO1.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.
BIO1.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.
BIO1.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.
BIO1.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.
BIO1.1.5 Equip students with Christian perspectives on scientific issues.
BIO1.6.6 Validate God as the Author of life, while evaluating aspects of divergent theories of origin.

Canoe Trip

A two-day voyage down the Peace River. The trip during the early autumn expands the exploration into the world of the insect or flower. This trip allows the students to expand their collection of species not normally found around school. Cost - $10.00

Archbold Research Station

A morning visit with staff entomologist Dr. Mark Deyrup, gives the students an intimate encounter with a research scientist, his work and discoveries. Cost - $5.00

The Preserves

A warm spring day in the natural setting of The Preserves, without interruption, permits the students to complete their insect or flower collection. Cost - none

Newfound Harbor Marine Institute - SeaCamp

A week-long immersion into the world of the Florida Keys. Exploring the coral reefs, shallow bays, mangroves and isolated islands, the students experience a trip of a lifetime. Cost - $1200.00

Grading Scale

A.....> 90%

B.....80-89%

C.....70-79%

D.....60-69%

F.....< 60

Supplies

- Watercolor Paints, Paper and Brushes
- Color pencils
- Journal - hardcover without lines if possible
- Pencils with small sharpener
- Metric ruler
- iPad with case

iPad Apps

- iTunesU
- iMotion
- Socrative student
- Numbers
- Pages
- Keynote
- iMovie
- iPhoto
- Garage Band
- Notability
- Explain Everything
- Schoology
- Adobe Draw
- Adobe Slate
- Adobe Spark Post
- Adobe Clip
- Adobe Photoshop Touch
- Google Drive
- RenWeb