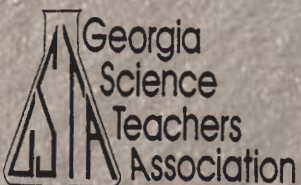


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- Invite a new teacher to come with you.

The Georgia Science Teacher

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Dr. Gail Marshall, Editor
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Editor's Note

The little loggerhead on the cover has no idea how dangerous the ocean is. Science classes are a wonderful place to address natural disasters like the devastation to the Gulf Coast. One of the positive opportunities a situation like this creates is the chance to help students understand many aspects of weather and geography that affect their daily lives. Take a break from your daily life and read the Georgia Science Teacher.

Steve Rich, NBCT- Editor
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Cover Photo: A newly hatched loggerhead turtle makes its way to the Atlantic Ocean on the beach at Georgia's Ossabaw Island.

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GUIDLINES TO SUBMITTING ARTICLES TO TGST

The Georgia Science Teacher is a journal for science teachers (K-college) in the state of Georgia. Articles pertaining to all facets of science education are welcomed.

Some examples are:

Activity Articles: practical, how-to articles which describe the procedures and materials for teaching certain concepts;

Teaching Methods: techniques such as questioning, using learning centers, developing a lab program, etc.;

Research Articles: syntheses or reports of research meaningful to science teaching, perhaps from graduate studies;

Philosophy or Position: articles stating a point of view about science education (topics such as assessment, legislation);

News: announcements of seminars, conferences, or special publications.

Length of articles is limited to six typed, double spaced pages. This includes the bibliography (APA style)

Photographs and diagrams are needed to go with each article. Students in photographs must have a signed parental consent sent in with the proposed article.

Deadlines:

December 1 for Winter

Submissions should be e-mailed attached in MS

Word to buterflywriter@msn.com

Reviewers this issue:

Dr. Gail Marshall, Dr. Terrie Kielborn

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Georgia Youth Science & Technology Centers

By Steve Rich

How often have you tried to teach science on a dime? How often have you wished for someone to help you accomplish this? The regional coordinator of your Georgia Youth Science & Technology Center may be just the person you are looking for.

Founded in 1989, Georgia Youth Science & Technology Centers, Inc. (GYSTC) is a private, non-profit educational organization designed to increase interest and enthusiasm in science, mathematics and the technologies, particularly among elementary and middle school teachers and students. GYSTC is headquartered at Chattahoochee Technical College outside Atlanta.

GYSTC has established thirteen regional centers across the state that provide staff development workshops and programs for teachers as well as assemblies, activities and camps for students. The programs of each regional center are defined by local school system needs.

Although some Georgia counties are not served by an area center, all Georgia teachers can take advantage of the certain programs, such as the NASA regional resource center located at the state headquarters. Teachers who are not part of a member system may also be able to negotiate certain services for a fee. Many GYSTC professional learning opportunities are open to teachers from throughout the State. "Xtreme Science" is a series of mini-conferences held at various GYSTC

locations annually. These events are co-sponsored by GSTA, and any teacher may pay the registration and attend.

GYSTC is truly a partnership of education, government and business and industry at all levels. Over 300 leaders across Georgia actively volunteer their time, experience and resources to serve on GYSTC boards of directors.

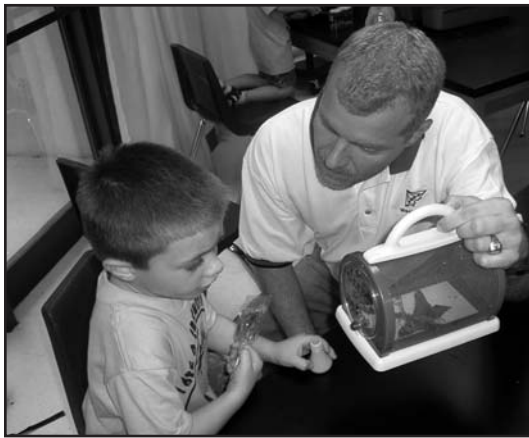
The state GYSTC board of directors is responsible of the overall direction of the organization and for securing and providing resources to support the program. High-ranking business and educational leaders and state Department of Education, Board of Regents and Adult and Technical Education officials serve on this board.

A typical regional GYSTC board of directors is made up of local school superintendents, curriculum directors, business and industry leaders, college presidents and faculty and government officials, all working to increase support for the Center and its vast educational activities.

There are only 17 full time GYSTC staff members across the entire state. The vast majority (13) are regional coordinators, who are all experienced science teachers, running and directing the operations of their local GYSTC. The remaining four are state GYSTC staff members working in curriculum, training, development and operations in support of the regional centers. The regional coordinators develop and present a wide variety of staff development opportunities, many of

which will be highlighted in a strand at the 2006 GSTA convention.

The programs of each center can vary according to the needs of area science teachers and the expertise of the coordinator. For example, the West GYSTC, located on the University of West Georgia campus in Carrollton, offers teacher training on earth science, outdoor classrooms, and grant writing. The center also hosts field trips to visit the outdoor fossil dig which features real fossils relocated from a Georgia mining operation.



Students (above) participated in a “bugs for breakfast” camp at the West GYSTC, where they ate chocolate covered crickets and investigated insect habitats.

Also at the West GYSTC, hundreds of children attend summer science camps on topics such as insects, flight, and forensics. Parents also get into the action during the school year when the center sponsors family science nights at area schools. The West GYSTC is among many of the regional centers that sponsor science teachers of the year, offering the recipient a monetary reward and the opportunity for professional learning.

Amanda Buice, is the state curriculum coordinator for GYSTC, is the former regional coordinator from the Gordon GYSTC in Barnesville. She believes that science education stands on the cusp of big things.

“Science teachers motivate the next true adventurers of our time – those who would produce the next Sputnik, the next big cure, or discover new animal or plant species,” she says. “Our students can literally save the planet, and the GYSTC regional centers can play a vital role in generating the excitement for science that will inspire students to achieve.”

If you think you could benefit from the services of the regional center near you, look for contact information on the GYSTC web site at www.gystc.org for additional details.

Steve Rich is regional coordinator of the West GYSTC. Contact Steve at srich@westga.edu for more information.



Regional GYSTC Locations

CHATTAHOOCHEE-FLINT GYSTC - Ga.
Southwestern State University, Americus
Lynn Larsen - lp@canes.gsw.edu

ETOWAH GYSTC – Highlands College, Rome
David Wright - dwright@floyd.edu
(706) 802-5322

FLINT RIVER VALLEY GYSTC - Thronateeska
Heritage Museum, Albany (229) 432-6955
Steve Rainey - frvgystc@heritagecenter.org

MIDDLE GEORGIA YSTC at MUSEUM OF AVIATION
- Warner Robins
Dave Hayden - mgystc@cox.net
(478) 926-6398

GYSTC at Chattahoochee Tech, Marietta
(State Headquarters) Tina Knight -
tknight@gystc.org (770) 528-4978
<http://www.gystc.org>

GORDON GYSTC - Gordon College, Barnesville
Dontauneya Traylor dtraylor.gystc@gdn.edu
(770) 358-4594

HEART OF GEORGIA YSTC - RESA, Eastman
Deborah Kirz - debbie@hgresa.org
(478) 374-2240 X114

MAGNOLIA MIDLANDS GYSTC - East Georgia
College, Swainsboro
Kathy Gunn - kgunn@ega.edu (478) 289-2094
www.ega.edu/facweb/gystc/index.htm

NORTH GEORGIA MOUNTAINS YSTC - Dalton
College, Dalton
Terri Myers TYMTeach@aol.com
(706) 272-2493 <http://gystc.daltonstate.edu/>

NORTHEAST GYSTC - North GA Tech, Clarkesville
Paige Carithers - negystc@northgatech.edu
(706) 754-7851 <http://www.northgatech.edu/gystc>

OCONEE RIVER GYSTC - Northeast Georgia RESA,
Winterville
Pamela Parks - pamela.parks@negaresa.org
(706) 742-8292 <http://www.negaresa.org>

SHENANDOAH GYSTC – Un. of West GA, Newnan
Cathy Wright - cwright@mail.newnan.westga.edu
(770) 253-4632 <http://www.shenandoahgystc.org/>

SOUTHWEST GYSTC - Bainbridge College
Donna McGlincy - dmcglinc@bainbridge.edu
(229) 248-3933

WEST GYSTC - University of West Georgia - Carrollton
Steve Rich - srich@westga.edu
(678) 839-6147
<http://www.westgystc.org>

Island Adventures with GYSTC



Kathy Gunn (above), regional coordinator of the Magnolia Midlands GYSTC in Swainsboro, is well-known for her successful professional learning trips to Ossabaw Island. Located just south of Savannah, Ossabaw is a unique island heritage preserve full of both science and history. Visitors to the island must be there for cultural, historic, or scientific purposes. Kathy has offered courses on the Island on topics such as earth science, sea turtles, and ecology. Her trips also feature delicious home-cooked meals which offer sustenance to her students as they recover from the excitement of visit to the nests of the endangered sea turtles. To learn more about Kathy's trips and the island, contact her at kgunn@ega.edu and check out the Ossabaw Island web site. www.ossabawisland.org



Newly hatched loggerhead turtles were escorted to the Atlantic Ocean by GYSTC regional coordinators in August.

EVOLUTION

It's a Fact! The Nature of Science Tells us Why

Dr. Clyde Wylie

Change

Prior to Copernicus it was a “fact” that the sun went around the earth. Experts repeatedly confirmed it with each sunrise and each sunset. These confirmations occurred despite the ‘wanderers’ that did not move in unison with the other stars. This developing anomaly, however, stimulated some of the leading astronomers of the 16th and 17th centuries, such as Copernicus, Kepler, and Galileo, to make even more precise recordings of and deliberative interpretations of the movements of the heavenly bodies. As a result they were able to not only modify, but replace, a complex and confusing explanation with a simple one: the sun, instead of the earth, is at the center of a ‘solar system,’ and the earth revolves around it. The view of Christianity over most of its history, based on a literal interpretation of the Bible, was that the earth is the center of the universe around which all heavenly bodies revolve. Because of the commitment to religious dogma, Galileo was told to abandon his beliefs (heliocentrism), and was later tried by the Inquisition and sentenced to the equivalent of house arrest. The Church held that his views were dangerous to faith. As a result of the steady amassing of evidence, the scripture embedded interpretation of celestial movements gave way to the naturalistic explanation, and it is now accepted that night and day are the consequences of the rotation of the earth on its axis (National Academy of Sciences, 1998).

The History of Biology

In the earlier teaching of biology, prior to 1900, abiogenesis, or the belief that life came from non-life, or for some the idea that God created life as it is in today’s form, out of the dust of the earth; ran through the textbooks as an accepted fact until the latter part of the century. These ideas slowly lost popularity because of the gradual acceptance, by textbook writers, of the germ theory, which was formulated by Wolff in 1759 and later demonstrated by Pasteur in 1861. Around 1910, biogenesis finally began replacing abiogenesis in the textbooks when the work of Pasteur and Wolff was “accepted as valuable information for children of secondary school” (Cretzinger, 1941, p. 312). “Cell Theory” had been around since Hooke discovered the ‘Little Box’ in 1665 but was not formulated until the work of Schleiden and Schwann came to light in 1838 –1839. “Cell Theory” did not get into the secondary school texts until after Mohl discovered the protoplasmic content of the cell in 1846.

The Nature of Science

Science is based on evidence and scientists use the best evidence they have to develop the best explanations they can. According to Futuyma (1995) scientists are not only motivated by their pursuit of knowledge but also their desire to develop a professionally admirable reputation. He suggests that the best way to develop

their reputation is to “demolish existing ideas by finding contrary evidence”. If there are better ideas that fit scientifically, they are used. The apparent lack of understanding of how science works on the part of many people is frustrating to those who understand how science works, but perhaps most frustrating to those who maintain evolutionary integrity. “Scientists have the ability to pose questions and resolve them in a way that critics, philosophers and historians cannot. Theories are tested, experimentally compared to reality, and those that are found wanting are rejected” (Horgan, 1997). Theories are far more than just ideas or explanations. “Ideas are not referred to as ‘theories’ in science unless they are supported by bodies of evidence that make their subsequent abandonment very unlikely” (NAS, 1998).

Mayr (1997) said that the scientist searches for truth, but many people who are not scientists make the same claim. Not only are scientific concepts misrepresented, but their relationships are also misunderstood. Misrepresentation and misunderstanding are key problems in the evolution/creation debate. As an example, a common misconception that is persistent in society is that substantiated hypotheses become theories, and those well substantiated theories that have stood the test of time become laws. In a study of eleventh and twelfth grade students, Ryan and Aikenhead (1992) found that 64% of the participants “expressed a simplistic hierarchical relationship in which hypotheses become theories and theories become laws, depending on the amount of ‘proof behind the idea’”. In fact, there is no hierarchical relationship between theories and laws. Chiappetta and Koballa (2004) offer these

delineations: “Laws and theories are distinct types of knowledge, and therefore, laws do not become theories nor do theories become laws. A law is used to describe a phenomenon or pattern in nature...A theory is used to explain a phenomenon.”.

In writing about evolution, Quammen (2004) says, “If you are skeptical of nature, unfamiliar with the terminology of science, and unaware of the overwhelming evidence, you might even be tempted to say that it’s “just” a theory. The notion that Earth orbits around the sun rather than vice versa, offered by Copernicus in 1543 was a theory. Continental drift is a theory. The existence, structure, and dynamics of atoms? Atomic theory. Even electricity is a theoretical construct, involving electrons, which are tiny units of charged mass that no one has ever seen.”. Theories are supported by facts and are given the same ranking in many cases. Futuyma (1995) states, “Evolution has, by now, the status of fact. It is one of the most important discoveries of science, and one of the most profound concepts in Western thought...”. Evolution has the status of fact because of the massive quantities of reliable verifications acquired. Evolution is supported in a fashion much the same way the Copernican rather than the Ptolemaic model of our planetary system is supported. Evolution is consistent with every comparison of anatomical structures, biochemical similitude, and vestigial structures between and among similar species. “But there is more to a good scientific hypothesis than corroboration; it must be falsifiable. And the hypothesis that evolution has occurred could indeed be falsified. A single undisputed fossil of a flowering plant or of a human or any other mammal in Precambrian rocks would do it. Millions of conceivable

paleontological discoveries could disprove evolution, but none ever has come to light.” (Futuyama).

Difficulties for Teachers

If teachers do not understand the nature of science, they will undoubtedly have difficulties explaining why one explanation is used in the science classroom while another is unacceptable. Perhaps understanding the nature of science would allow for delineation between religion and science (NAS, 1998). That mankind evolved from apelike creatures—much less an “ooze” from the ocean is currently and will most likely continue to be impossible for many to accept. Creationists hold tight to a literal interpretation of the Biblical account of how the earth and man were brought into being. According to Genesis approximately 6000 years ago God created the heavens, the earth, man and all animals in 6 – 24 hour days. Also, man and all animals exist in the same form today as they did in the initial creation. Suggesting otherwise to many creationists would have one condemned to hell for eternity. To add to these moral and ethical pressures there are also legal issues that teachers must deal with. Teachers face a number of difficulties beyond the traditional teaching responsibilities. Teachers are exposed to pressures from peers, from administration, from school boards, from parents, and from students.

Why Not Creationism?

Creationism arises from faith and should only be argued in those terms. Science has no position to argue terms of faith for any religion. “Science does not and cannot deny the existence of the supernatural. Explanations employing supernatural events and deities are beyond nature and, hence, beyond the realm of science. Science deals with the natural world, and

consequently, its explanations must be couched in natural expressions with no recourse to the supernatural” (Clough 2000). Likewise, “creationists’ theory” is an oxymoron. Theories are supported by evidence and in scientific terms, there are no “facts” to support the creation position; therefore, it is not a theory, and it is not science.

Personal Perspective

Evolution is supported by unrequited facts. These facts are used as measures of accuracy of past as well as future proclamations. If they don’t fit, they are not used. Religion on the other hand is based on faith, love, emotions, and spiritual needs. All these things are real parts of everyday life, but unlike science they are not based on quantifiable, testable facts. Strength in religion comes from strength in one’s belief system and one’s faith. The stronger one’s faith, the stronger one’s religion.

Science is used to explain things based on very few rules or laws. Each of these laws describes relationships that are measurable and are supported by facts. The facts that support these laws are pieces of information that are repeatedly supported by evidence. There is only one scientifically accepted explanation for the changes in life over time and that is evolution. The inability of some to designate distinct parameters for each of the aforementioned factors--science, education, and religion--is of great concern from a biology education standpoint because a lack of distinction promotes not only incognizance, but also resistance to learning. The science classroom should be used to teach just that – science. This conflict, in-fact, deteriorates the very base of biology education by denouncing the foundation of biology - the evolutionary theory: “Nothing in biology makes sense except

in the light of evolution” (Dobzhansky, 1973, p. 125).

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Comparing Computerized Tests to Paper-and Pencil Tests In Middle School Science

By Arixie Sproul

Since the advent of No Child Left Behind, high stakes achievement testing as part of educational assessment has been pushed to the forefront in education. The report of TIMSS study of the mediocre performance of US schools has had a rippling effect. Conventional testing revealed that only 5% US adolescents perform well at tasks requiring higher order thinking skills (Wiggins, 1998); this effect may ultimately lead to restructuring the curriculum to lower levels of learning. According to Terry Meier, "standardized achievement tests tend to focus on mechanical, lower-order skills ..." rather than the upper level skills that are expected (Dietel, 1991; Meier, 2000). High stakes testing dictates legislation and public policy affecting how science is taught (Glaser, 1994). This effect may translate into more teaching in preparation for achievement testing that tends to be geared toward multiple choice exams that provide an easy-to-score method of assessing student performance (Dietel, 1991; Mellow, 2005). Aside from the high stakes testing, classroom teachers often settle for mediocre signs of knowledge and understanding. According to Wiggins, the problem of mediocrity is greatly aggravated by a world of high stakes testing (Wiggins, 1998). Coupled with the demand for performance on achievement test, there is a demand for the implementation of technology. A review of literature of studies investigating the use of technology to administer test that have historically

been administered by paper-and-pencil, revealed issues of the positive or negative effects of computerized testing and concerns of examinee performance worthy of reflection and further exploration.

Even with all the discussion about mixed assessments, it is clear that one traditional aspect, tests, will likely remain a part of the cache of tools used by teachers to judge student learning. A marriage of technology and testing seems to be a logical way to incorporate these two tools and perhaps take some of the tedium of grading papers off the teacher's 'to do' list leaving time for more thoughtful planning of instruction. In an effort to critically examine the usefulness of computers in testing, careful inspection of research in the equality of computerized tests and paper-and-pencil tests merited further investigation such as advantages of computerized testing over paper and pencil tests, possible negative effects of computer based tests, and concerns of examinee performance as a result of inexperience with computers.

The purpose of this study was to determine if there exists a significant difference in the performance of students based on the mode of test administration for objective type tests. The operating null hypothesis was there is no significant difference in the test scores of paper tests compared to computer tests.

The study similar to a study conducted by Michael Russell in 1999 consisted of two chapter tests of 24 and

21 objective (multiple choice and fill in the blank) questions created with Exam View Protest Generator for LAN based test by Holt, Rinehart and Winston. Each chapter test was given to the students on computer and on paper in an identical format. The computer tests revealed one question per page, and the paper tests had multiple questions per page. Study guides, class discussion and peer study groups provided the review for the material tested.

In addition to the chapter test, students were given an adaptation of the Computer Attitude Questionnaire developed by Dr. Gerald Knezek and Dr. Rhonda Christensen. The survey contained a 95 item, 5 point Likert-type scale where students rated themselves on a scale of 1 (strongly disagree) to 5 (strongly agree). From the 95 items, 38 questions were selected and the demographic section was modified to apply to sixth grade students. Two subscales measuring computer enjoyment and computer anxiety were separately scored. The purpose of the questionnaire was to determine the student's familiarity, perceived skill level and attitude toward computers.

Surveys and tests were given to 83 sixth grade students who attended a middle Georgia urban Title I middle school. The students who participated in the study consisted of 43% male and 53% female, 80% were black, 17.6% white, 2.2% Asian. The students were a heterogeneous mixture of special education 8.8%, low achieving students 46%, and high achieving students 23%.

The result of the study was twofold. The CAQ analysis revealed an overall score of 42 (out of 82) signified the students enjoyed using the computer. The subscale of computer anxiety revealed a score of 44 (out of

82) showed the students did not feel anxious using the computer. These results indicated that a test administered on the computer would result in minimal negative consequences on student performance.

Test scores of the two chapter tests of the paper version and the computer test version were paired and analyzed. A t-test was conducted on the sets of test scores for each test. Analysis revealed highly significant differences in the test scores ($\alpha = .05$, $df = 82, 76$, p calculated = -2.86, -3.63, p critical = 1.99 respectively) indicating a significant effect between the treatments. A positive Pearson correlation 0.8687, 0.732 was also disclosed.

Student performance may have been affected by several factors. Among those factors could have been fatigue, (taking a computer test immediately followed by a paper test). Not all "sharing" information was eliminated because students immediately observed their computer tests did not display the same question order as their neighbor. Marking answers on the scantron answer sheet for the paper tests could have been a source of student error resulting in affected scores.

Testing has become a high stakes venture. The pressure educators face with the No Child Left Behind Act and accountability for higher achievement has become a driving force. Due to high stakes testing reliable tools have become more important. Computerized testing as part of a mixed assessment for middle school science might provide some relief to the pressure educators currently experience. This study conducted on 6th grade middle school

students provided evidence that the students tested performed as well or better on computer versions of objective test than on the paper and pencil format. The computer provided numerous advantages such as immediate feedback, time economy for

the teacher, less paper for the environmentalists and the students indicated they enjoyed taking the test on the computer. If computer tests make a teacher's job easier, it merits further study.

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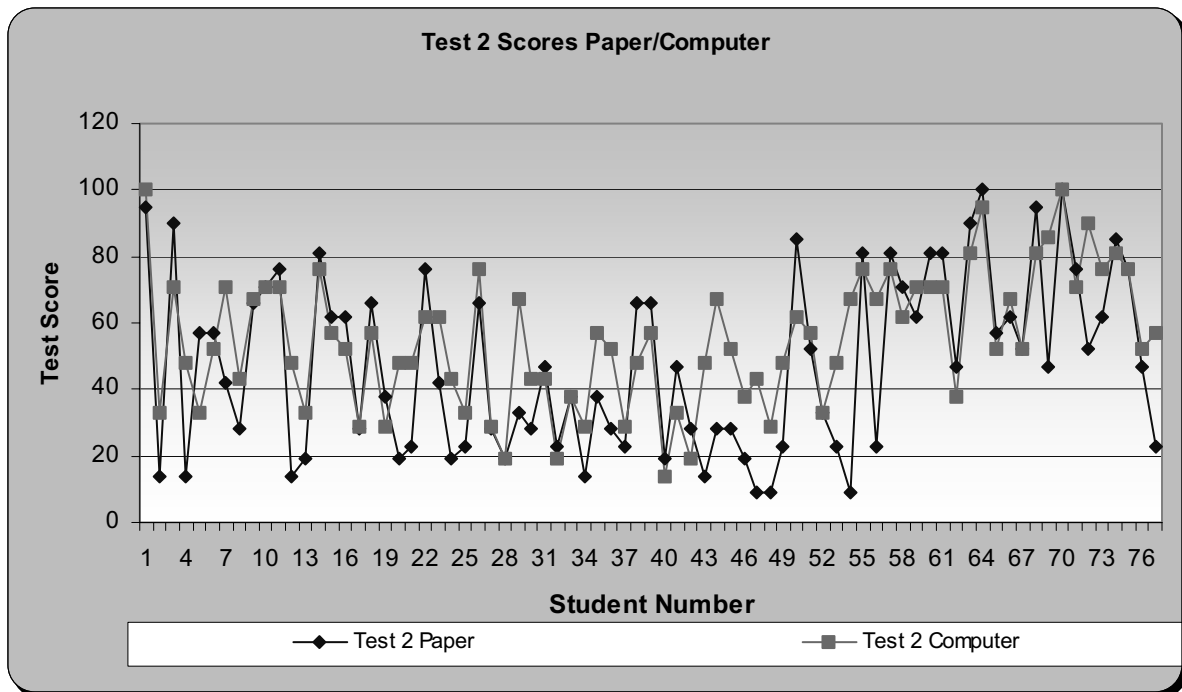
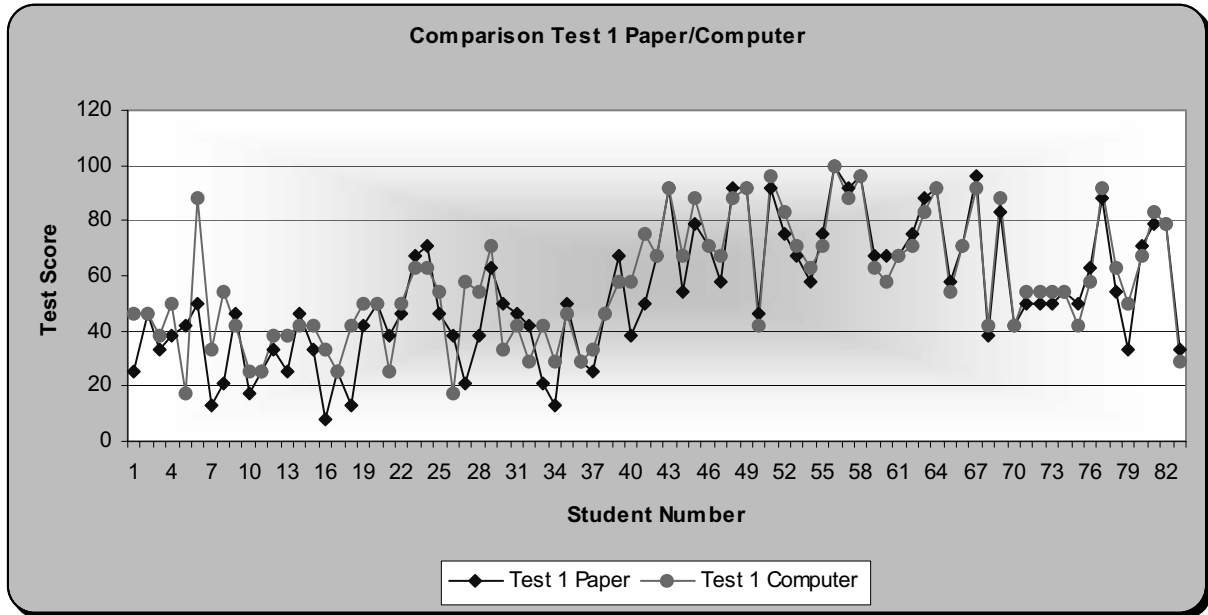
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Graphs supporting Computer/Paper Testing Study



Students concentrating on the computerized test.

Students Get Their Hands on Clean Air: New Lesson Plans Provide Tools for Teachers Statewide

Since its inception in 1996, The Clean Air Campaign has emphasized public education on the importance of healthy air and a call to personal action to reduce polluting behaviors. Creating a fundamental and long-lasting change in our mobility “ethic” is a long-term process, so the organization is turning its attention to the citizens and commuters of the future: elementary and middle school-age children.



Exciting, standards-based air quality curriculum units for grades 4 to 8 provide students with a hands-on education that integrates air quality with the health, transportation, land use and energy issues facing the state of Georgia. The lessons cross several subjects including science, social studies, geography, mathematics, health and English, offering students comprehensive and integrated insight into the topic areas.

Topics include:

- Properties of Air
- Chemistry of Air Pollution
- Air Pollution in Metro Atlanta and Georgia
- Green Vehicles
- Lung Power & Air Pollution
- Monitoring Air Pollution
- The Heat Island Effect
- The Six Infamous Air Pollutants
- Traffic Jams
- Weather and Ground-Level Ozone, and more

Created by The Clean Air Campaign in collaboration with educators, scientists and health experts, the lesson plans are scientifically accurate, highly engaging to students and practical for classroom application.

“The kids really enjoyed The Six Infamous Pollutants lesson. Designing and drawing the posters in groups got them excited and engaged,” explained Brian Walker, a 5th grade teacher at Minor Elementary. “It also allowed them to take a usually unexciting topic and make it creative, interesting and fun.”

The lesson plans have been carefully crafted to meet the new Georgia Performance Standards (GPS). The lesson plans are now available at cleanaircampaign.com, as well as the Georgia Learning Connections (GLC) and EEinGeorgia.org Web sites.

More Information–
www.cleanaircampaign.com
www.glc.k12.ga.us
www.eeingeorgia.org

BOOK REVIEW

Book Title <u>Dear Professor Einstein</u>	
Author Edited by Alice Calaprice	
Publisher MJF Books	Publication Date 2002
ISBN 1-56731-626-3	
Fiction/Non Fiction Non-Fiction	Main Topic Albert Einstein
Reviewed by- Ann Robinson	Grade Level 6-12
Keywords from book Curiosity, Children, Education, Pictures, Letters, Einstein	
Content Summary (2-3 sentence limit) Short book on Einstein's life with letters from children showing their interest in science. Pictures are included.	
Summary of Science Concepts (2-3 sentence limit) The World Year of Physics 2005 celebrates Einstein's life. Reading this book could reveal to teachers, parents, and students how scientists introduce creative ideas to the world and have a humanitarian influence as well through the life of Einstein.	
What is a good use for the book (struggling readers, enrichment, history of science, etc.?) (2 sentence limit) This book could be read to elementary students or assigned as part of the reading requirement for middle and high school. After reading students may find a possible role model in Albert Einstein.	

If you would like to review a book for The Georgia Science Teacher, find the form on the GSTA web site at www.georgiascienceteacher.org and submit it to the Editor.

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2006 Conference Guest Speakers

Opening Session – Thursday, February 16, 2006 Dr. Art Eisenkraft, lead author and project director of Active Chemistry and Active Physics, and former NSTA President, will address the opening session on Thursday morning, February 16, 2006. Dr. Eisenkraft is associated with the company, It's About Time, which specializes in developing research-based math and science programs. From their website, "It's About Time believes that students learn math and science the way that practicing scientists and mathematicians do. They learn when something grabs their attention...when the content is relevant to their lives. They learn when we allow them, in fact encourage them, to talk to one another and question each others' results. In short, when we allow students to use all of their senses, they make sense of math and science."

Featured Presentations - Thursday, February 16 (Times TBA)

Two special presentations will feature **Dr. Bill Robertson, Ph.D. and author of the well known book series, *Stop Faking It! Finally Understanding Science So You Can Teach It.*** Bill will conduct two hands on, interactive workshops in which he will help teachers learn to motivate students in science as the teachers better understand how to interweave content and characteristics of science. (Ticketed presentations. Participant number limited.)

Luncheon - Thursday, February 16, Noon - 1PM

Join fellow GSTA members for an enjoyable buffet luncheon and a chance to hear **anthropologist/archaeologist, Dr. Warren Church, Ph.D.**, Dr. Church will speak about his work in the Peruvian Andes. Dr. Church is well known internationally for his work in this area and currently is on the faculty at Columbus State University. (Ticketed session. Participant number limited.)

Conference General Session - Friday, February 17, 10 AM - 11AM

Everyone must be sure to attend the Conference General Session to hear **Dr. Harvey Silver, Ph.D.**, and to participate a dynamic presentation which actively involves the audience as he models techniques for promoting higher level thinking. Dr. Silver, from Strong, Silver & Associates, is well known for his 30 plus years of work to help teachers understand how to motivate students and help them become more independent thinkers. (Open session. No limitations on number.)

Dr. Silver will also be presenting in a special session later on Friday. Time TBA. (Ticketed session. Participant number limited.)

Awards Luncheon and Program - Saturday, February 18, 1 PM - 3 PM

State School Superintendent Kathy Cox will be the guest speaker for the Awards Luncheon and Program. Since taking office in 2002, Kathy Cox has been instrumental in the development and implementation of the Georgia Performance Standards. In this endeavor she has been extremely supportive of the needs of science. This luncheon will be an exciting time as we hear from her about the current status and projections for the future of science education in Georgia. At the same time she will help us recognize educators from across the state who are "shining examples" of those who are providing great science instruction.

Register for the conference at -

www.georgiascienceteacher.org



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