



The Nucleus

*Official Quarterly Newsletter of the
Texas Association of Biology Teachers*

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From the Editor:

One semester down and one to go! The school year is in full swing, and this seemed the perfect time to dedicate an issue of *The Nucleus* to sharing teaching ideas and techniques, and planning for summer.

Included you will find activities for a variety of ages, grade levels and abilities. With science assessment in TAKS rapidly approaching, this publication is a great forum for giving a “leg up” to teachers previously focused on reading, writing, and arithmetic. District and state mandates alone do not drive vertical teaming – we do – crossing not only grade level boundaries, but geographic ones as well.

Another aspect of entering a new semester is looking ahead to summer and comparing the many opportunities for professional growth through workshops, seminars and institutes. If you’ve attended a program that was especially worthwhile, please let me know so I can share it with our readers.

In this issue, read about the Master Teacher Summer Institute hosted by the University of Texas at Austin. As a former attendee, I can attest to the value of the time spent reinforcing concepts, learning new technologies, and networking with peers. I came home refreshed in life science concepts, with renewed confidence and an address book full of new friends. Application time is short, so get busy!

TABT officially has a new president, Keith Watson. Turn the page to read his first

column. I’m sure you, too, look forward to meeting Keith and working with him.

Looking forward to spring, the 2002 ExxonMobil Texas Science and Engineering Fair will be held in the Arlington Convention Center April 11-13. It’s proximity to the Ballpark in Arlington and Six Flags Over Texas will give students a chance to have fun during their stay.

Having attended the Intel International Science and Engineering Fair in San Jose, California last May, I was impressed with the strong representation of Texas students. Many walked away with scholarships and prizes. I look forward to viewing this year’s projects in Arlington. The quality and insight students apply to their work never ceases to amaze me. I hope you all get a chance to attend our state fair. It can only fill your heart with pride in our students, our schools, and our state.

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A Message From Your President

By Keith Watson

It was one of those warm “Indian Summer” days in the fall of 1985. During one of our often-lively daily conversations Alton Biggs demanded, “Give me five dollars. I’m signing you up for a new organization that is being formed.” The organization turned out to be the Texas Association of Biology Teachers (TABT). If you know Alton very well – he and I have shared a professional and personal friendship for almost 30 years, so I think I know him pretty well – you know that he wouldn’t leave me alone until I gave him the money.

Alton didn’t bother to tell me that Julia Riggs, Gerald Skoog, Dan Wivagg, and others had conspired to trap him into being the organization’s first president, but it wouldn’t have mattered to me if he had. Alton had already roped me into membership in the National Association of Biology Teachers, another organization he has since served as president. From that simple beginning in 1985, I’ve become convinced that TABT is a great organization. For one thing, TABT is the only professional association solely dedicated to promoting quality biology education in Texas.

My professional association with TABT spans 16 years, and has been one of the most rewarding of my career. Through TABT, I have become friends with many of the most outstanding educators in Texas. I have learned so much from so many of you. We have shared meals together, solved problems together, discussed ideas together, and laughed together. I thank each of you for that friendship.

While our dues are no longer \$5.00 as they were in 1985, for only \$10.00 you have all of the benefits available then (such as our quarterly newsletter, *The Nucleus*) plus so many more. I would like to encourage you to visit the website for TABT: <http://www.texarkancollege.edu/~mstorey/TABT/index.html>. I would like to personally thank Mark Storey and David Allard for their work as webmasters and for keeping us all informed.

The weekly URL update from Alton is a tremendous source of useful information. There is a new automated e-mail list serve available designed to help members communicate with one another more efficiently. You may sign up for this on the announcements link in the website. Our website also contains links to many other sources of information. TABT gets better and better as we find new ways to serve our membership.

As we strive to encourage our students, let’s work together to strengthen our profession and ourselves. As we enjoy the benefits of our membership in TABT and the professional contacts that our membership brings, let’s encourage our colleagues in our districts to join us. Hand someone in your department a membership form so they can join TABT. Bring a friend with you to the Conference for the Advancement of Science Teaching (CAST) in the fall and introduce them to the many valuable activities available. Let us all promote TABT to make it that much stronger.

As I teach during the beginning of this spring semester, I look forward to Spring Break. The warm beauty of East Texas will allow me to do some of my gardening and other chores on my small farm. I also relish the opportunity to observe the marvelous array of spring flowers and budding trees found here. All of these joys, of course, are made possible because of the wonderful world of biology surrounding us. Let’s strive to impart the wonder of the world around us to our students so that they, too, may understand the way the world works.

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ExxonMobil
Texas State Science and
Engineering Fair

April 11-13, 2002
Arlington Convention Center

[http://www .uta.edu/cos/tsef](http://www.uta.edu/cos/tsef)

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UT Master Teacher Summer Institute Announces 2002 Sessions

Oliver Wendell Holmes once said “Man’s mind, stretched to a new idea, never goes back to its original dimensions.” Such is the theme for the University of Texas’ Master Teacher Summer Institutes which aim to stretch teacher minds during a four week experience co-hosted by the Colleges of Natural Science and Liberal Arts.

The 2002 Summer Institutes in the areas of Calculus (AB), Biology, and English Language will be held June 3-28, 2002. The Biology session will be taught by Dr. Ruth Buskirk with lab assistant from Jane Delaney, master AP biology teacher from Leander High School. Participants will explore two strands of the AP curriculum: biochemistry/physiology and heredity/evolution.

The institute builds not only content knowledge but works to integrate technology as well. To facilitate this instruction, participants will receive a personal laptop computer for use during and after the institute. Technology sessions are individualized depending on the learner’s experience and confidence level.

In addition to the laptop computer, participants will receive a \$1000 stipend as well as all room, board, and travel expenses. Three hours of graduate credit are available through the Continuing Education Division of UT.

MTSI expectations are that applicants will participate fully in the four-week institute demonstrating a desire to increase their content knowledge and share it with others.

Eligible teachers should maintain an interest in achieving “equitable access for all students to Advanced Placement courses on their local campuses”. Teams consisting of a pre-AP and AP teacher are encouraged, but individuals will be considered. Each applicant needs to have completed a five day pre-AP or AP workshop in their discipline.

Participation in MTSI commits teachers to staying in touch for reflections, shared problem-solving, and exchanging ideas.

Applications are available online at <http://www.uteach.utexas.edu/mtsi> or through Dr. Mary Walker, project director at marywalker@mail.utexas.edu. Deadline for submission is **March 4, 2002**.

Personal Reflections ... MTSI 2001

Last year, I was fortunately chosen to attend the Biology Institute of MTSI 2001. We were housed in a private dorm (the Castillian) directly across from campus. Rooms were spacious and my partner and I each had our bedroom within the suite. Meals were surprisingly good, the air conditioner worked well, and there was plenty of hot water ... most of the time! Sharing space and elevators with numerous summer campers was tedious at times, but never unbearable. The dorm staff made us feel welcome and problems were dealt with quickly.

Content sessions led by Dr. Ruth Buskirk were like being in college again. I gained notebooks full of information to share with colleagues and students (expect to see some in the pages of *The Nucleus*).

Jane Delaney made prep work look effortless. A session with several AP labs set up on laptops with Vernier probes and an experienced facilitator was an experience I would not otherwise have had. I learned so much from Ruth and Jane, as well as my fellow participants, that I’m only sorry I can’t do it again. Get busy with your application!

Team of Teachers from Katy Learns Emerging Computational Science Methods

A gifted team of teachers from Katy Independent School District in Katy, Texas is embarking on an 18-month educational journey during which they will undergo computational science training and professional development. As participants in the National Computational Science Leadership Program (NCSLP), Julie Cooper, Bekki George,Carolynn Raper, and Constance Javor will learn how to use computational modeling techniques and simulation programs to introduce students to new and exciting ways of learning math and science.

The SC2001 high-performance computing conference, which took place in Denver, Colorado November 10-16, kicked off the team's training. The team met with teachers from the United States and England and began training in the latest techniques in computational modeling and simulation programs.

From January to June of 2002, the team will partner with leading computational scientists and other teachers and technology coordinators in monthly chat sessions focusing on a variety of science, math, and leadership topics. Their training will culminate in a two-week summer institute in July. Through active participation in the NCSLP, team members have the opportunity to earn up to 18 continuing education units (CEUs).

"Through this program, we will be able to radically change how science and mathematics are taught in the classroom," said Dr. Jeffrey C Huskamp, CIO at East Carolina University and Principal Investigator for this program. "Integrating computer modeling simulation, and visualization into the curriculum will better prepare students for the challenges they will encounter in school and in the workplace."

The \$2 million National Computational Science Leadership Program was established by a consortium of institutions that currently include the Association for Computing Machinery, East Carolina University, Krell Institute IEEE Computer Society, National Center for Atmospheric Research, National Center for Supercomputing

Applications, NPACI & San Diego Supercomputer Center, Oak Ridge National Laboratory, Shodor Education Foundation, Stanford Linear Accelerator Center, and the University of Alabama in Huntsville.

Supporters of the program are the National Science Foundation Association for Computing Machinery, Cisco Systems Compaq Computer Corporation, High Performance Systems, IEEE Computer Society, IEEE Foundation, Microsoft Corporation, NASA, SBC DataComm, Shodor Education Foundation, and Wolfram Research.

The results of the program will be a comprehensive set of classroom modules that follow national education standards and are available to all high schools across the country. For additional information about the National Computational Science Leadership Program, visit www.ncsec.org.

Local contact is Jennifer Farris, Information Specialist (252) 328-2502.

Science Kit & Boreal Laboratories Announces Digital Microscopy Workshop

Tom Avery of Science Kit invites educators to attend a workshop in Irving, Texas on Friday, April 5. Participants will investigate applications of digital microscopy in a variety of practical settings including web applications. Ideas for implementing into existing curriculum will be studied.

Registration for the session begins at 8 a.m. in the Best Western Inn on the John Carpenter Freeway. The fee of \$850 will include lunch and a complimentary Boreal Digital Microscope valued at \$549.

See page 7 of this issue of *The Nucleus* for additional information.

Investigating Properties of Water

by Jane Delaney, et.al.

The importance of water to biological systems is a universal concept in life science, regardless of grade level. Giving students hands-on observations of polarity, adhesion/cohesion, imbibition, etc. eases their transition to chemical solubility, buffering systems, xylem transport, and other applications.

This series of activities may be used for a variety of ability levels. Materials can be assimilated and students develop their own inquiry-based labs. Younger students can be directed through focus questions and discussion.

ACTIVITY ONE

Materials:

- foam plate
- water mixed with food color
- dropper bottles of rubbing alcohol

Apply a thin layer of colored water to the plate. Drop alcohol into the water and observe what happens. Explain your results.

ACTIVITY TWO

Materials:

- waxed paper
- dropper bottle of colored water
- second bottle with different color water plus detergent
- dropper bottle of plain water

Place a drop of each solution on the wax paper. Determine which of the solutions is polar and explain based on your observations.

Alternative version

Materials:

- petri dish filled with colored water
- vegetable oil
- detergent

Add a drop to the surface of the colored water and observe. Add a drop of detergent to the same water and observe. Explain the behavior of the water molecules.

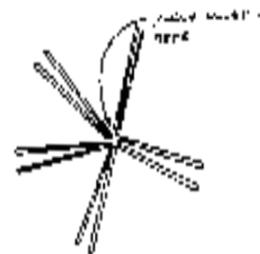
ACTIVITY THREE

Materials:

- five flat toothpicks (round will not work)
- eyedropper
- water

1. Break five toothpicks in half but leave the parts together in a V-shape.

2. Place the five V-shaped toothpicks on a smooth surface with their points as close as possible. See sketch at right.



3. Make a prediction as to what will happen to the toothpicks when a drop of water is added to the center of the arrangement. Record your hypothesis.

4. Using the eyedropper, add one large drop of water to the center of the toothpick configuration.

5. Observe carefully what is happening to the toothpicks and record.

Questions:

1. What did the water do with the toothpicks?
2. What material are the toothpicks made of?
3. Based on the characteristics of water that you have read about, how can you explain these results?
4. What will happen to picked flowers when they are not placed in a vase in water? According to what you know about characteristics, why do they need water?
5. How does water reach the top leaves in a tall tree?
6. Compare a dry, broken toothpick with one that was wetted by holding one of the legs of the V-shape and pushing the other leg down. Which one stays closed (down)?

Pedigree Analysis Lab

Woodrow Wilson 1995
*“Is it possible for someone
to be his own grandpa?”*

Purpose: To construct a pedigree as a way of recording a family’s ancestry; to develop critical thinking skills by analyzing song lyrics to obtain scientific data; to stimulate discussion on how pedigrees can be used to predict the inheritance of genetic disorders within families, and the bioethical concerns and decisions that face such families.

Equipment: pencil, song lyrics, and paper

Procedure:

Note: Each student should have introductory lessons on pedigree symbols and inheritance patterns.

- 1) Listen carefully to the lyrics of the song “I’m My Own Grandpa.”
- 2) Each student pair is challenged to draw a pedigree based on the song.
- 3) Teams will illustrate their pedigree the chalk board.
- 4) The class will evaluate all pedigrees as you go through the words of the song again, step by step.
- 5) Credit for the lab will be based on an accurate pedigree.

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Song Lyrics:

“I’m my Own Grandpa”

*Many, many years ago
when I was just twenty-three,
I was married to a widow,
she was pretty as could be.
This widow has a grown-up daughter
who had hair of red
And my father fell in love with her.
Soon they, too, were wed.*

*This made my dad my son-in-law ---
changed my very life!
My daughter was my mother
because she was my father’s wife!
To complicate the matter even though it
brought me joy,
I soon became the father of a bouncing
baby boy.*

*My little baby he then became
a brother-in-law to Dad.
Well, that made him my uncle --
made me very sad.
Because if he was my uncle,
then also he was brother
to the widow’s grown-up daughter,
who, of course, was my step-mother.*

*My father’s wife then had a son who kept
them on the run.*

*And, of course, he became my grandchild
because he was my daughter’s son;
My wife is now my mother’s mother
and this makes me blue
Because although she is my wife,
she is my grandmother, too!*

*Now if my wife is my grandmother, well,
then I am her grandchild.
And ever time I think about this,
it nearly drives me wild!
Because now I have become the strangest
case that you ever saw
As husband of my grandmother,
I am my own grandpa!*

Science Kit & Boreal Laboratories

Presents

Introducing Digital Microscopy into your Classroom

(Title II -- Dwight D. Eisenhower Eligible)

Friday, April 5, 2002

Best Western DFW Suites, Irving, TX

Workshop Summary: This workshop will introduce you to the exciting world of digital microscopy using practical examples that are being used today in classrooms across the United States. The workshop will be given from an application point of view with demonstrations of how to integrate this very powerful technology (including web applications) into your existing curriculum. In addition to the training, all participants will receive a *complimentary Boreal Digital Microscope (a \$549 value) and lunch at no additional charge.*

Schedule

| Time | Event |
|----------------|-----------------------------|
| | Registration |
| 9:00 - Noon | Lunch |
| Noon - 1:00 pm | Digital Microscopy Workshop |

Who Should Attend: Science Teachers, Science Department Chairs, Supervisors, Curriculum Directors, Technology Specialists, and Administrators.

Cost & Registration: \$850. Make Checks payable to Science Kit & Boreal Laboratories and mail with registration form below to
Science Kit, Attn: Shirley Doak, 777 East Park Drive, Tonawanda, NY 14151-5003.

Location: Best Western, 5050 West John Carpenter Fwy, Irving, TX 75063 (972) 870-0530

Name _____ School _____
Primary Course of Instruction _____
Contact Address _____
City _____ State _____ Zip _____
Contact Phone Number _____ - _____ - _____
Contact email address _____



Texas Association of Biology Teachers
c/o Alton Biggs, Computer Records Clerk
1002 Madera Court
Allen, Texas 75013-3639



Membership Application
(Please Print)

Name: _____ Telephone: (____) _____

Home Street Address, City, State, Zip: _____

E-mail address (if available): _____

Type of membership: Active (\$10) Student (\$5) Retired (\$5) Life (\$250)

Please complete the following to assure balanced representation in planning TABT activities.

1. Professional Class (**Check one only**)

Biology Teacher Department Chairman Curator/Interpreter
 Supervisor/Administrator Teacher Training Student
 Other _____

2. Male Female (**OPTIONAL**)

3. Have you ever received the OBTA? No Yes If yes, what year? _____

4. Number of years teaching? _____

5. Organizational Class (**Check one only**)

Elementary Middle/Junior High Secondary College/University Zoo/Aquarium
 Business/Institution Other _____

6. Special Interests (**Check no more than 2**)

Cellular/Molecular Botany/Plant Science Laboratory Science Reproduction/Evolution Zoology
 Computer Instruction Environmental Biology Teaching Materials Other _____

7. I am also a member of (**Check all that apply**)

National Association of Biology Teachers (NABT)

National Science Teachers Association (NSTA) Science Teacher Association of Texas (STAT)

Make all checks payable to: Texas Association of Biology Teachers

Please send membership application and your dues to:

Alton L. Biggs, TABT Records Clerk – 1002 Madera Court – Allen, Texas 75013-3639