The Nucleus

Official Quarterly Newsletter of the Texas Association of Biology Teachers

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From the President:

By Keith Watson

As we look forward to the coming summer and a much-needed break from school, there are still many things that we must do. In the next two months, most of us will be preparing for the last edition of the Biology I EOC, and many of us will be "field-testing" the new TAKS tests. My school is scheduled for this April 23. You may or may not agree with the Texas academic assessment program, but these tests do give us an opportunity to assess what it is that we do in our classrooms and, perhaps more importantly, how we do it. This leads to the important consideration of what we do in our classrooms.

What do our classrooms look like? How do we know what a good classroom is? When I first began to teach biology a quarter of a century ago, I am certain my classroom would not fall into the category of "good"! While some may still not categorize it that way, it seems to serve my students well. For instance, I maintain a wide array of aquaria, and as many plants as I can. I can tell you honestly that there has not been a vertebrate dissection in my classroom more than twelve years, even though I once believed that a complete survey of the animal kingdom was necessary to "properly" teach biology. I came to understand that I was "teaching the way I was taught" and that there needed to be some changes made to my teaching methodology.

I have found that many interesting methods that can be used to teach comparative biology. This is not to say that I am "anti-dissection." I would still use dissection if it was the only way to teach a particular objective, but I haven't found that to be the case. Biology is the study of life and living things. I think it is much more important to study living "critters." The lack of dissection in my classroom has had no measurable impact on the achievement of my students, and I've seen no convincing data to suggest that it does for anyone. As a matter of fact, I'm convinced that Alton Biggs was right when he once wrote, "You are the essential force in the learning process." There is substantial evidence from a variety of studies to indicate that you – the teacher – and your attitude and behavior are more important than any fact or concept you can impart to your students.

As we complete this school year, with the field testing of TAKS and the last of the EOC Exams, let each of us strive to make our classrooms and labs the very best that they can be. Let's do our best to make our students understand the marvelous array of life that surrounds us all.

Inside this issue:

ExxonMobil State Science Fair

Dr. Neil Smatresk and the crew of the University of Texas at Arlington again hosted the Texas Science and Engineering Fair, April 11-13, but this time they held it in their own backyard instead of Austin. Projects were set up in the Arlington Convention Center Thursday, judging commenced on Friday, and the award ceremonies held Saturday. The 957 projects comprised the largest fair ever, and the quality of the student work promises that Texas will be well represented in international competition in May.

The venue transition from Austin to Arlington meant more than a change in driving time for contestants and chaperones. The location of the Convention Center made it convenient for students to attend Six Flags or a Rangers game at The Ballpark in Arlington.

Generous corporate sponsorship by ExxonMobil Corporation, Texas Workforce Commission, Intel, Holt, Rinehart and Winston, Smurfit-Stone, Texas Instruments, Kellogg, Brown & Root, and the Texas Higher Education Coordinating Board kept registration expenses to an affordable $20. A website managed by UTA kept all participants up to date on forms and procedures.

Grand prize winners were:

Junior Division:
* Russell Burrows of San Antonio
* Ashley Woodall of Rowlett

Senior Division:
* Mengfei Huang of Houston
* Saujan Sivaram of Houston
* Alice Chai of Plano

College tuition scholarships were awarded by the University of Texas at Austin, the University of Texas at Arlington, and Texas A&M University at Commerce.

A full list of winners in each category is available online at http://belinda.uta.edu/Cos/winners.asp. Congratulations to everyone who displayed. We take pride in the accomplishments of our students, wherever they may be.

Intel International Science and Engineering Fair

Louisville, Kentucky
May 13-17, 2002
Good luck to our competitors from Texas!

TABT thanks our generous sponsors!

Corporate sponsors:

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Ward's Natural Science Establishment

Advanced Biology Journal Assignment

Jane Delaney of Leander High School served as lab facilitator for the 2001 Master Teacher Summer Institute in Biology at the University of Texas. The following assignment is given to her preAP biology students during the first semester of school. She has graciously agreed to share it with TABT members.

Each six weeks you will be required to turn in a Science Journal. It will consist of **two** entries, each of which will be worth a maximum of 50 points. There are two types of entries. You must turn in one of each type each six weeks. The Science Journal composes 10% of your six weeks grade.
General Directions: Each entry type must be 2-3 typed pages minimum, 11 point font, double spaced.

ENTRY Type A: You will need to find a LONG article written about a **biological** topic in the newspaper (cite the name of the newspaper and the date of the article) or a recent magazine (last 6 months - *Discover, Newsweek, Time, Science News, Popular Science, Scientific American,* etc.). You must read the article and **submit a copy** of it with your entry. Your entry should be a thorough, well-written SUMMARY in your OWN words with an ANALYSIS/EVALUATION of the article.

QUESTIONS TO PONDER:

What is the article about? What do I think about this? Is the article objective? What are the strengths and weaknesses of the article and of the information given? How could the article be improved? How will this information affect society? How does this relate to the real world? Why is the information important to know? ...etc.

Use proper DOCUMENTATION to list your references. Plagiarism will not be tolerated.

ENTRY Type B: You will need to research a **biological** topic or idea discussed in class that you would like to investigate further. Your research may include an encyclopedia (only **1** may be used, either in book, CD-ROM, or internet), magazines, journals, textbooks, library books, interviews with experts, internet, etc. More than one source must be used and you should go beyond an encyclopedia (book, CD-ROM, or internet); a **variety** of sources is expected! There should be a **minimum of 4 sources** for this assignment. Your journal entry should include the following:

A. A brief INTRODUCTION on why you chose this topic.
B. A thorough SUMMARY of what is presented and what you learned.
C. An ANALYSIS/EVALUATION of what is presented. (See Questions to Ponder above.)
D. Proper DOCUMENTATION to list your references. This should be done on a page **separate** from your journal entries. It should list the references that you used for Entry A and Entry B on the same page. Follow the format rules found on the next page.

Your Science Journal should be in a report folder with a Title page and proper heading. Only QUALITY work will be accepted as that is the only type expected.

A **QUALITY** project should:

a) Be neat and legible.
b) Show that you put time, thought, and effort into it.
c) Have correct spelling, grammar and punction.
d) Have clear and thorough explanations.
e) Have diagrams neatly drawn and labeled.
f) Demonstrate that you have knowledge about your topic.
g) Be your own work. No plagiarism!!

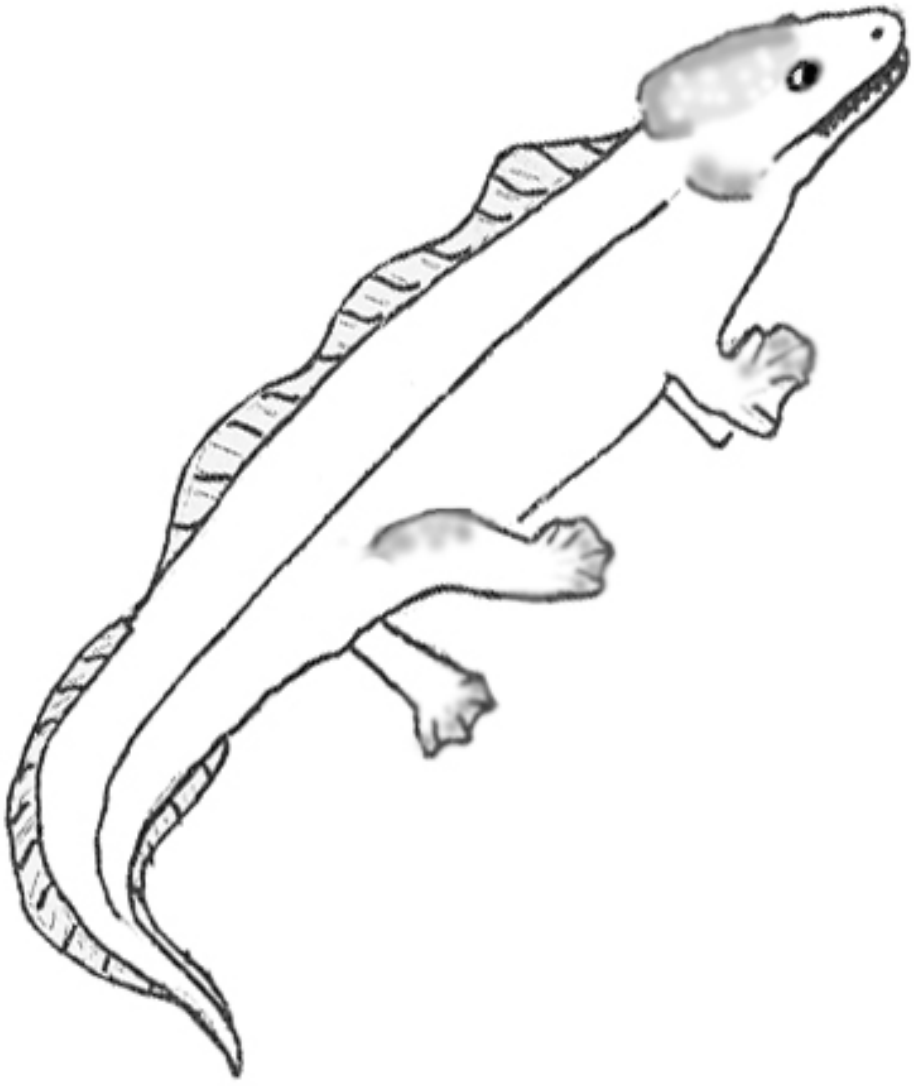
Evolution Activity

Jane Menerey, *et. al.*

This activity works best for younger students (grades 7 or 8), but older students have enjoyed it. The main concepts students should learn are the role of chance in evolution and how evolution works with the variations that are available in a population.

Have students seated in rows. Tell students to clear their desk surfaces of everything, except pen or pencil and a sheet of blank paper. Give copies of the drawing below to the students at the backs of the rows. Allow students 15 seconds to reproduce the drawing without tracing it. At the end of the allotted time period, the students pass their drawings to the person in front of them, and the process continues. When time has expired for the students at the front of the rows, show their drawings to the class.

Students can discuss the similarities and differences, as well as how the process is similar to and different from evolution. You may make a bulletin board showing "descent" and "phylogenic" lines. Each row could represent a "line of descent."



Estimating Population Sizes by Alton Biggs

Microscopic organisms usually populate their environment in a method called "boom or bust" because the numbers may be tremendously high when conditions are favorable and very low when resources are limited. In this activity, you will ***hypothesize*** what the population is for several organisms, ***collect data*** on the actual number of organisms per drop of water, and ***estimate*** the total populations in a given volume of water.

First, observe the cultures of organisms. Pay special attention to the apparent density of the organisms in the culture. Does the culture look thickly populated? If so, there must be a very high population. If it appears that the water is almost clear, there may be many fewer organisms.

A hypothesis is a statement about a natural phenomenon based on observational evidence. Write a hypothesis that indicates what you think the population is for each organism studied.

For each organism, make a wet mount slide. Count the actual numbers of organisms in one high power (400X) view on your microscope. Write your data below.

organism name	population	organism name	population
organism name	population	organism name	population

At 400X, you can see approximately 260 different views per drop of water. Also, there are 30 drops of water per milliliter. So, if you can multiply the population in one view X 260 views/drop x 30 drops/ml, you can find the population per ml. Then, if you know how many milliliters of water there are in the culture, you can find the total population.

REPORT

1. For each organism, determine the estimated population/ml.
2. For each organism, determine the estimated total population.
3. Make a drawing of each of the organisms you counted. Follow your instructor's directions for making laboratory drawings.

Software Review

The following is BioQuest Software review is by Gail Carmack of The University of Texas. The price for a high school site license for all programs is $350.

Current Collection - Mac Only:

Biota

Models the ways that species interact to cause changes in each other's population over time and simulates research methods in population dynamics by providing the option to turn chosen simulations into black box problems and providing the tools to investigate these problems as if they were field studies.

Demography

Simulates exponential growth in age-structured populations.

Evolve

Hardy-Weinberg simulations

Genetics Construction Kit (GCK)

Classical Mendlian genetics simulation

Isolated Heart Laboratory

Explore how the ventricle of the human heart performs as a blood pump and to alter its performance.

SequenceIt!

Experience the art and logic of protein sequencing through experimentation.

Current Collection - Cross Platform:

***Biometrics**

Explores common questions adn techniques as to why particular tests are applied to specific biological data.

***Data Collection and Organization**

Designed to give you background and experience with some useful, commercial available, generic software tools. Has separate Excel data files.

Environmental Decision Making

Use "connect-the-components" visual programming tools to create and study model ecosystems.

***Modeling-A Primer**

Learn how to use, analyze and criticize some historically influential models in biology.

Collection Candidates - third stage of review
Mac programs

Axon

Simulation of the classic Hudgkin-Huxley model of axon excitation

Fractal Dimension

Tool for analyzing the fractal dimensions of objects including scanned images of real world objects.

MacRetina

Simulates an experiment in which students record date from retina ganglion cells.

Microbial Genetics Construction Kit

Investigate the characteristics of an unknown set of bacterial using serial dilution, phenotype identification, complementation testing and conjugation mapping.

Modeling Tools:

Logisti Growth and Blending Inheritance

Designed to accompany Modeling. Allows exploration of mathematically simple models important in ecology and population genetics using a variety of modes of visualization.

Science Kit & Boreal Laboratories Announces Digital Microscopy Workshop

Tom Avery of Science Kit invites educators to attend a workshop in San Antonio, Texas on Friday, November 15, 2002. 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 7:30 a.m. in a soon-to-be announced hotel. 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 and a registration form.

Science Kit & Boreal Laboratories

Presents

Introducing Digital Microscopy into your Classroom

(Title II -- Dwight D. Eisenhower Eligible)

Friday, November 15, 2002 in San Antonio, Texas

Workshop Summary: This workshop (choose one session) will introduce you to the exciting world of digital microscopy using practical examples practiced today in K-12 classrooms across the United States. The workshop will be given from an appication point of view with demonstrations and hands-on labs showing how to integrate this technology into your science curriculum (Biology, Geology, and Physical Science). In addition to the training, all participants will receive a **Boreal Digital Microscope (a $549 value) and lunch at no additional charge.**

Session Schedules

Morning Session

Time	Event
7:30 - 8:00 am	Registration
8:00 - Noon	Digital Microscopy Workshop
Noon - 1:00 pm	Lunch

Afternoon Session

Time	Event
11:30 am - noon	Registration
Noon - 1:00 pm	Lunch
1:00 pm - 5 pm	Digital Microscopy Workshop

Who Should Attend: K-12 Science Teachers, 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. Space is limited and every effort will be made to accommodate first choices regarding workshop sessions which are to be filled on a first come, first serve bases. **Deadline** for receiving registration is the Monday prior to teh workshop (**November 11, 2002**). For additional information contact Tom Avery at (800) 242-2042, ext 242, Fax (800) 828-3299, or email at avery@sciencekit.com.

Location: San Antonio hotel location to be announced

Name: _____ School: _____

Primary Course of Instruction: _____ Workshop City: _____

Address: _____ Session Preference: _____

City: _____ State: _____ Zip: _____

Contact Phone: _____-_____-_____

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

Texas Association of Biology Teachers

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