Kansas Association of Biology Teachers Newsletter

Volume 44 Number 1 - May 2003

KABT Web Site
http://kabt.org
NABT Web Site
http://www.nabt.org

Newsletter Contents

Area & Topics Page Number(s)

PRESIDENT'S COLUMN
By Sandy Collins

May should be an uplifting time of year for teachers. Another group of students has had the opportunity to learn under our care, new labs and content have been infused into our class, old ones have been perfected, and the hallways are riotous with the sounds of our happy students. Turns out that "uplifted" is not the word that describes most of us. In fact, most of us feel downright frazzled and dismayed. We are miserably focused on what we didn't cover or implement, what we did cover but what they still don't appear to understand, and all of the kids we didn't reach (i.e., those students who we suspect pretend to barf when our name is mentioned). In other words, our optimism of August – that this will be the best year ever – is spent.

In the face of all this dismay as we focus our disappointments, we make our blue state of mind even worse as we become frantic about cramming as much as possible into those last weeks of May. Boy, we are determined that these weeks really will be the best. We put ourselves in overdrive in this frantic last minute push.

So what have we accomplished by all of this critical, end of the year self-evaluation and frantic activity? We have single-handedly made ourselves miserable, we have not enjoyed Spring as we would have liked to, and we have probably made ourselves quite unpleasant to live with. What a terrible thing to do to ourselves.

Now, I don't mean to say throw-in the towel

and coast through May – that would be impossible and probably not a healthy or rewarding alternative. But I do offer the following alternative to our teacher analog of "self flagelation". Focus on what you did accomplish this year. If you are honest, you know that your students know more about the living world now in May than they did in August. Think about how some of the kids have flourished in terms of their ability to think more abstractly, to think beyond "I won't ever use this", and their enhanced ability to be critical thinkers. You know, there probably is at least one student – maybe even "some"- that just might now think that the living world is quite amazing or at least worthy of their interest. Think of the times you stood back and thought wow, isn't this great?

Take time out and do what you like to do this time of year. Plant those rose bushes, watch the sunset, read a chapter in the book that have been sitting untouched, go to a baseball game. Not thinking about school all the time is a good thing - that is the value of hobbies. When your thoughts do return to school you will be refreshed, able to think clearly and have the energy to realistically plan for a good end of the school year for both your students and yourself.

Your optimism of August may have dissipated, but it does not need to be replaced by utter pessimism in May. This is just a hypothesis, but I predict that if you follow any of the advice presented above, your family, friends and students will be grateful. And you might even enjoy this last month of the school year with your students, as you well deserve!

WELCOME TO NEW KABT MEMBERS

At KATS Kamp, Carol Willamson invited Todd Carter and me to the New Teachers Reception. This is an event that Carol hosts for pre-service teachers and those in their first two years of teaching. The enthusiasm in this room full of new teachers was almost palpible!

Life science teachers were invited to join KABT and NABT. As a result, we have the opportunity to welcome 10 new KABT members. To have new members – whether novice or veteran teachers – will make our professional organization stronger and more beneficial to all life science teachers in Kansas. Thank-you for joining and getting involved.

Candy Bryant
Jaimi Burke
Jennifer Clark
Brian Cole
Kathy Gann
David King
Tenille Poling
Sarah Spencer
Adrianne Wedel
Kendra Workman

Editor's Message
By Harry McDonald

Like Sandy, I have been occupied lately with the rush to the end of the school year. I have also enjoyed watching my son compete in his first season of high school track. However, I have been more preoccupied with news about my brother.

My 48-year old brother has been diagnosed with glioblastoma multiforme, a far too typical and far too lethal form of brain cancer. His diagnosis in August of last year led to surgery, followed by the requisite chemotherapy and radiation. By Thanksgiving it was clear that his case was following the normal course for this disease and was growing again. In the past, this diagnosis meant a person had only a year to live.

For a variety of reasons, this disease does not respond well to treatment. Chemo has significant challenges because of the blood/brain barrier. (On the positive side, this same type of barrier makes this type of cancer highly unlikely to metastasize.) Radiation, in doses sufficient to destroy the tumor, destroy the brain.

Enter science. Our ability to understand the basic biology of how cells respond to signals which stimulate cell division, our ability to isolate these chemical signals, our ability to understand the process of apoptosis and how it is triggered, these and other advances in our basic knowledge of cell biology are providing options never before available.

For my brother, his oncologist suggested he join a trial for a new treatment, one based on this new knowledge. It seems that many types of tumors respond to epidermal growth factor as part of their abnormal rate of division. The new treatment was testing an epidermal growth factor inhibitor.

One month after beginning the trial my brother's tumor had shown no growth. I was with him that day.. My brother is not a man prone to overt displays of emotion, but we celebrated that day.

Monthly check-ups continued to show no growth for six months. Then came his last check-up. The tumor was growing again. His call to me that night was from a meek individual I almost didn't know. His voice was low and soft. His tone sad. Inspirationally, what was missing was despair.

He and his doctor had already plotted out a new course of action. At first the doctor offered a new round of traditional radiation and chemotherapy. My brother rejected those. They were largely unsuccessful with an unacceptably high rate of mortality.

My brother pointed out that scientific knowledge of tumor behavior had given him six months of normal life. During that time he had returned to work and normal family interaction. He wanted to know what else was new and based on the same kind of science.

The doctor mentioned another clinical trial involving the P10 gene and its product. It seems that this and other related genes are integral in apoptosis. If cells respond normally, when they become cancerous, apoptosis will be triggered and the cancer cell will die before a tumor develops.

My brother's tumor is P10-product negative. I haven't found out yet exactly what the new therapy is designed to do, but, from what I understand, it will attempt to trigger a normal functioning of this gene.

To give the new treatment the best chance of success, my brother will have another surgery to remove the tumor. The location of the surgery involves the risk of losing sight in his left eye.

By the time I talked again to my brother, his spirit had returned. His attitude was that science had given him six months. If this new treatment was only equally successful, science had the next half-year to develop the next advance in treatment.

Some of the explanations I gave here may not be 100% accurate. I will visit my brother in June and will have an opportunity to learn more about the physiology of his treatment. What is significant is that we all work in a field that is providing this service to my family and all of mankind.

We may not conduct this research ourselves, but we provide the foundational knowledge that enables the current and future generations of scientists the ability to save lives.

In my brother's case, I felt helpless. I increased my giving to various cancer research agencies. But what has made me feel the best was grading those final exams and saying to myself, "Yes, you really a making a difference."

Call For Articles

In the last newsletter, I asked you to send in original or modified labs to share with each other. I can now appreciate all those years that John worried about the content of his newsletter and pleaded with us to share our ideas.

I have evidently not proven a magnet for such submissions either. There is no lab in this newsletter and that is a shame.

All submissions don't have to be original. If you have taken a "tried and true" lab and modified it to suit your needs, consider sharing the new version and your rationale for modification. If you do this, please cite the original source of the lab, or at least where you got the original idea.

Please submit all articles as attachments in Microsoft Word or a format readable by Adobe Acrobat. This saves the editor (ME) from having to retype everything submitted.

Call For Articles II

The last newsletter contained a piece of student work, a book review by Eric Min. I requested that others submit outstanding student work to be included in the newsletter. I have received none. (I have received a book review from Dru Clarke and it is found elsewhere in this newsletter.)

This section will be included in the newsletter only when items are submitted. I will be hesitant to include work from my students issue after issue.

Please submit all articles as attachments in Microsoft Word or a format readable by Adobe Acrobat. This saves the editor (ME) from having to retype everything submitted.

Call For Articles III

In the last newsletter, I called for Letters to the Editor, in response to items seen in the newsletter. I repeat this call.

I would like to include a regular section of letters to the editor. These can be either positive or negative reactions to what is printed. I would also appreciate opinion papers on anything of current interest to biology or science education in general.

Please submit all articles as attachments in Microsoft Word or a format readable by Adobe Acrobat. This saves the editor (ME) from having to retype everything submitted.

Call For Articles IV

I would like to include a section in the August newsletter on interesting ways to start the new school year.

If you have any ideas/activities that can be used in the first week of school that introduce science, the methods of science, the nature of science, the nature of biology, the use of observation, etc., consider sharing with your fellow KABT members.

Please submit all articles as attachments in Microsoft Word or a format readable by Adobe Acrobat. This saves the editor (ME) from having to retype everything submitted.

All submissions need to be emailed to me, biologycctrack@hotmail.com, by August 1 to make it into the next newsletter.

Biology Education News

By JR Schrock

Not all teachers consider ADHD a genuine medical condition and over 1/4 think students will outgrow the disorder, according to a survey "Perceptions of ADHD Among the Public, Parents, Teachers and Children" by Feinstein Kean Healthcare (see Sept. 18, 2002, Educ. Week, p.6. According to research in the Oct. 9, 2002, Journal of the American Medical Association, the brains of children with ADHD are slightly smaller than for peers by about 3%, and never-medicated ADHD children had smaller white-mattter volume than medicated ADHD and normal children.

Older people may still lose bone mass despite taking calcium and vitamin D supplements; a new form of vitamin D called 2MD really increases bone density in mice and may work for humans. (See Oct. 15, 2002, Proc. National Academy of Sciences)

Carbon fertilization from the increase in CO_2 concentrations from 280 to 375 ppm since the Industrial Revolution accounts for perhaps 30% of the increased growth of forests; the rest of the excess carbon is stored in new forests growing on previously

cleared land and from thicker forests from ffire management(See Sept. 20 Chronicle Higher Educ. pp. 18-20)

Large scale studies indicate lumpectomies are as effective as full mastectomy, and radiation treatment improves survival in either case in breast cancer, according to research reported in the October 17 New England Journal of Medicine.

New Swedish contraceptive patches using the estrogen ethinyelstradiol contain enough of the hormone to alter fish development when only a few patches are flushed and travel through treatment plants. (see Oct. 19 Science News)

When a corn earworm caterpillar attacks a celery plant, the plant starts producing toxic chemicals; entomologist May Berenbaum of the Univer. Of Illinois and a Chinese collaborator have discovered that this in turn triggers the earworm to activate antitoxin genes the researchers have located, countering the plant's defense. (See Oct. 17 Nature)

The story of the kangaroo rat mainly eating seeds and living on metabolic water, while hiding in cool burrows until night needs revision; researchers Tracy and Walsberg found the burrows considerably hotter and the rodents ate substantial amounts of green plant tissues containing water. (See Oct. 19 Science News)

Update on State Science Assessments

Editorial by Harry McDonald

As many of you know, in 2006, schools will be required to begin annual testing in science. This is no longer a requirement under ESEA, but will be a requirement for continued accreditation in Kansas.

The current plan calls for two tests instead of one, one covering the biological sciences and one covering the physical sciences (chem, E/S, and physics). As I understand it, both will cover the science standards not specific to one of these fields.

No longer will the test be administered in all schools to all sophomores within a specific window. Instead, tests will be administered to all students at the discretion of the school, as it stands now, sometime between the freshman and junior years. This would mean that it would not be necessary to schedule all sophomores to take the test at the same time. It will no longer be necessary for all students to take the test in the same year. Schools will be able to administer the test to a particular student when the school thinks that student has mastered the standards to be tested. It is envisioned that these tests will be administered online. Guidelines will be coming out from the KSDE on how to handle the logistics of this depending on the number of students to be tested and the number of computers available in a school.

As with the previous state content test, the current plan calls for testing only certain indicators from the state standards. There is concern that, with such limited scope, coupled with the pressure to show mastery tied to school accreditation, schools and districts will be even more tempted to replace a broad curriculum, that is consistent with the National Science Standards and with the National Benchmarks, with one that addresses only the indicators covered by the test.

This last fear is compounded by the idea that these two state tests will be end of course tests. Personally, I like this idea but I feel we would be better served if students were to be randomly tested (generated from a computer test bank) over any of the indicators in the state standards, not just select ones.

Such an approach would encourage schools to develop curricula (and follow those curricula) which are consistent with the National Standards and with ALL of the Kansas State Standards. The current and projected limited scopes of coverage do not encourage such comprehensive curricula.

Although I believe it is the spirit of these tests to encourage schools to remediate individual students who are found deficient, the current and the proposed testing protocols do not accomplish this.

Currently tests are given in the 4th, 7th and 10th grades. This allows schools time to provide additional instruction for those individual students who are judged to perform at either the unsatisfactory or basic levels. The problem is that students are never tested again to see if schools accomplished that feat.

The only current use of the test results is to report what percentage of students are performing at a

KBAT Spring 2003 Field Trip

For more information, contact Mike Fell: michael-fell@usd465.com

This year's spring field trip will be to the Nature Conservancy's Tallgrass Prairie Preserve just north of Pawhuska, Oklahoma (http://oklahomanature.org/OK/map/tallgrass_map.html)

(http://nature.org/wherewework/northamerica/states/oklahoma/preserves/tallgrass.html). For directions, see the map at the bottom of the page, or use the following latitude and longitude for directions with MapQuest to locate the preserve: Latitude: 36° 50 Min.44 Sec., Longitude: -96° 25 Min. 31 Sec. If you are coming from the north, or from the west, follow highway 166 to Sedan and turn south on 99 to head towards Pawhuska.

The plan thus far is to arrive Friday and set up camp, find a motel room, etc. The closest camping facilities which include RV sites as well as tent camping is Osage Hills State Park (http://www.touroklahoma.com/Pages/cabin7.html). It is a beautiful place constructed in the 1930's by the civilian conservation corps (CCC). There is a small lake, hiking trails, a creek with a small water fall and it is only about 20 minutes from the Tallgrass Prairie Preserve. It is located eleven miles west of Bartlesville on US 60, or 5 miles north of Pawhuska on state highway 99 then 8 miles east on US 60. The only glitch is that they will not reserve sites and it is on a first come first served basis. So if you can, arrive early in the day, grab a spot and explore. In the event that there are no spaces left at Osage State Park, Wha-Sha-She State Park on Hulah Lake is just a little farther north with good facilities (http://www.shopoklahoma.org/oklakes/hulahlake.htm). It is 15 miles northeast of Pawhuska on State Highway 99, then 10 miles east on State Highway 10. I would suggest the west campground (Lakeview area) as there are both RV and tent sites and showers are available. For those who would rather not camp, there are motels and places to eat in both Pawhuska and Bartlesville (www.VisitBartlesville.com, www.pawhuskachamber.com). There might be a possible Tallgrass Preserve nightlife tour if it can be arranged.

On Saturday, the tentative plan for the field trip is to meet at 9:00 am at the preserve headquarters. If there is interest in an early morning birding adventure we can meet earlier. I have arranged with Bob Hamilton, who manages the preserve and Pete Earls (a research assistant in geography and botany at Oklahoma State University), and possibly a few more local experts to share their expertise with us on our tour of the preserve. Bob will talk about the use of fire and bison, and the preserve in general. Pete is planning on guiding a field presentation on native plants and contemplating on bringing PowerPoint slides on work that he and Mike Palmer are developing of spatial models of vegetation diversity using GIS, based on burn and grazing data. With the abundant spring rains we've had in this area, there should be numerous species of wildflowers, not to mention a bumper crop of new baby bison running around on the prairie. I have been to the preserve several times since February, and each time have been able to drive right through the bison herd and view their behaviors up close. In my opinion, the prairie vistas and bison viewing rival anything I've seen at Yellowstone. Be sure to bring your cameras and radios for communication between vehicles. Binoculars would be handy as well. Plan on bringing a sack lunch. There is a picnic area at the headquarters and pop machines, restrooms, and a small gift shop/nature museum. There is a self-guided nature trail near the headquarters as well. We will go as long as there are things to see and interest in seeing them but should be done before suppertime.

On Friday, if you come early, or on Sunday, it is worth the short drive south of Bartlesville to see Woolaroc Ranch, Museum and Wildlife preserve. It is the former country estate of oil baron Frank Phillips, founder of the Phillips Petroleum company. This itself can be an all day adventure. It is open Monday-Sunday from 10:00 am-5:00pm and costs $5.00 for adults, children under 12 are free. Other events that are scheduled to occur the same weekend as our field trip include a biplane expo (www.biplaneexpo.com) on June 6-7 and Sunfest (www.bartlesvillesunfest.org).

(Editorial comment: These field trips provide a wealth of knowledge for our own growth and which can be taken back to the classroom an improve our instruction. Maybe more importantly, they provide an opportunity for leisure. We enjoy a beautiful summer day in the company of friends and fellow educators.)

*"**I hope the insight you have here gained, makes the observing student find…. Tongues in trees….. Books***

in the babbling brooks, ……. Sermons in stones….. And beauty in everything." **Michael Faraday, c. 1840**

Book Review

By Dru Clarke

Charles Darwin: The Life of a Revolutionary Thinker

Dorothy Hinshaw Patent (2001) New York, N.Y.: Holiday House. 144pp.

Annotation:

A scholarly and eminently readable biography of the "man who not only changed the course of biological science but changed forever how philosophers and theologians conceive of man's place in nature." (writer William Bowlby) His disdain for traditional schooling, dominated by the "boring lecture," drove him to seek out mentors (Henslow and Lyell) and learn from experiential walks and intimate conversations with these knowledgeable naturalists. His acceptance as naturalist on the Beagle, commanded by the accommodating Captain FitzRoy, gave him the observational data that led to his earth-shaking *Origin of Species,* his book on the theory of natural selection. A host of other books followed, based on his acutre powers of observation and ability to synthesize seemingly disparate faacts. Perhaps his greatest legacy is the lesson he taught biologists, to ask "Why is that so?"

A Quotation: (in his teens, with brother Erasmus)

"In their teens, Charles and Erasmus carried out chemistry experiments in the tool house at The Mount (their home), earning Charles the nickname "Gas" at school. The two boys often worked late into the night. 'This was my best part of my education at school, for it showed me practically the meaning of experimental science,' he later wrote of the experience.

Charles may have valued this scientific endeavor, but science was not considered a proper study for a budding country gentleman. 'I was also once publicly rebudked by the

Publicly rebuked by the head-master, Dr. Butler, for thus wasting my time on such useless subjects…' " p. 17, (Dr. Butler, stifle thyself!)

Distinctive features:
Intelligent and insightful writing; b&w photographs of Darwin's contemporary life and culture and influential figures; a chronology; map of the journey of the Beagle; a list of friends and colleagues of Darwin; a glossary; a selected bibliography; internet sources; index.

Curricular connections:
Social studies and science: Research his contemporaries (e.g. Alfred Wallace, Charles Lyell) and create bulletin board/mural of resulting finds; compare today's "cutting edge" research with Darwin's time; write and illustrate original journals/logs of natural species to be found in a local environment, using other naturalists' logs as examples; research the places the Beagle made landfall (Brazil, where Darwin contracted Chagas Disease that eventually led to his death, Argentina, Tierra del Fuego, the Galapagos); have a reader's circle or reader's theatre dealing with the topic of the nature of science (how theory is different from belief, what evidence is, how science is not absolute truth and how its conclusions are open to new data and change).

Math: Compute the miles/kilometers of the voyage; measure natural objects (like plants) and draw themproportionally to real size (introduce the concept of scale).

Related sources:
See Patent's selected bibliography (over 30 cited)

Darwin, Charles (1831-35). *The Voyage of the Beagle*. Annotated and with an introduction by Leonard Engel. Reprinted in 1962. New York, N.Y.: Doubleday & Company.

Gelman, Rita Golden (1991). *Dawn to Dusk in the Galapagos*. Photos by Tui de Roy. Boston MA.: Little, Brown, and Company. The photographer has lived in the Galapagos all of her life and has created photographs for previous books about the Encantadas or "Enchanted Isles."

Wallace, Alfred Russel (1869). *Malay Archipelago*. Reprinted 1962. New York, NY: Dover Publications, Inc. Darwin's contemporary who simultaneously theorized natural selection and was life-long admirer of Darwin. His area of observation was in Malaysia where Darwin never visited.

Professional Opportunities

For a multimedia digital library of lesson plans and professional development resources for K-12 teachers, try Teacher's Domain, www.teachersdomain.org/. Each resource is tailored to specific grade levels and correlated to national and state standards. This site was developed by WGBH with funding from the National Science Foundation.

The following site has lessons for high school/undergraduate level classes along with articles examining bioscience issues. Lessons are written by educators and correlated to NSES standards. Articles and lessons cover biodiversity, environment, human genome, biotechnology, evolution, new frontiers in the sciences, and education: www.actionbioscience.org.

PUMAS is an on-line journal of brief examples illustrating how math and science concepts taught in pre-college classes are actually used in everyday life. They are intended to help K-12 teachers enrich their presentation of science and math in the classroom. All submissions are peer-reviewed by at least one scientist and one teacher. The site can be searched by curriculum topic, grade level, or subject. Submissions are welcome as are volunteers for the pool of reviewers. Try

the one on, " Could a World of Swimmers Raise Sea Level?" I found this an interesting exercise in the application of data. See if it doesn't give you additional ideas for similar activities: http://pumas.jpl.nasa.gov.

Web Opportunities

Try www.nature.com/nature/food to access *Nature's* web focus on food and the future. The site includes a view about food production and sustainability

Try www.mathcs.carleton.edu/probweb/probweb.html for a site packed with links on chance, probability, and statistics. This site is from Carleton College in Northfield, Minnesota.

Try www.bbc.co.uk/dinosaurs/ for a BBC site with simulations where you live the life of a newborn dinosaur and see how long you last.

Try www,arkive,org to see fim and recordings of rare and extinbct species. The ARKive project is gathering, digitizing, and storing media of endangered speices from around the world. The archive currently has 5000 images, along with background on about 1100 species.

Try www.myccancergene.org to keep track of the genes governed in some fashion my the *myc* gene. The site currently profiles 647 genes including each gene's function, and how it is linked to *myc*.

Try deepgreen.stanford.edu to see images and movies of how green fluorescent protein has been used to visualize the inner workings of plant cells.

Try www.informatics.jax.org/mgihome/GXD/aboutGXD.shtml where you can pick a particular stage of mouse development and determine which genes are working in particular sturctures.

Try atlas.villa-bosch.de/dbase/dsmm/ for computer simulations of shape-shifting molecules folding, unfolding, and a variety of other functions.

Try www.brisbio.ac.uk to find an archive of 8500 free medical, veterinary, and dental images of various parasites, diseased tissue, cellular structures, xrays of joint structure, and many more.

Tidbits

The first peer-reviewed studies of the genomic sequences of two SARS virus strains and are now available at www.sciencemag.org/feature/data/sars/. Because of the grave public concern over this disease, AAAS has made this information freely available to all users.

According to a report published in *Nature*, May 22, a recent study comparing the mDNA sequences in the white-footed mouse to the prairie deer mouse over the past 150 years, establishes that only one mouse out of 52 mice sampled between 1999 and 2000 had the mDNA sequence that was most common among the animals collected prior to 1950. This illustrates the speed with which mammalian evolution can occur.

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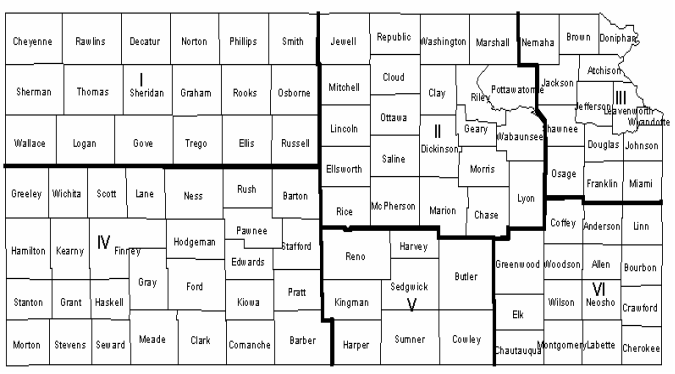

Counties In Region 1

Cheyenne, Decatur, Ellis, Gove, Graham, Logan, Norton, Osborne, Phillips, Rawlins, Rooks, Russell, Sheridan, Sherman, Smith, Thomas, Trego, Wallace

Counties, In Region 2

Chase, Clay, Cloud, Dickinson, Ellsworth, Geary, Jewell, Lincoln, Lyon, Marion, Marshall, McPherson, Mitchell, Morris, Ottawa, Pottawatomie, Republic, Rice, Riley, Saline, Shawnee, Wabaunsee, Washington

Counties In Region 3

Atchinson, Brown, Doniphan, Douglas, Franklin, Jackson, Jefferson, Johnson, Leavenworth, Miami, Nemaha, Osage, Wyanodotte

Counties In Region 4

Barber, Barton, Clark, Comanache, Edwards, Finney, Ford, Grant, Gray, Greeley, Hamilton, Haskell, Hodgeman, Kearny, Kiowa, Lane, Meade, Morton, Ness, Pawnee, Pratt, Rush, Scott, Seward, Stafford, Stanton, Stevens

Counties In Region 5

Butler, Coffey, Cowley, Harper, Harvey, Kingman, Reno, Sedgwick, Sumner

Counties In Region 6

Allen, Anderson, Bourbon, Chautauqua, Cherokee, Crawford, Elk, Greenwood, Labette, Linn, Montgomery, Neosho, Wilson, Woodson

Your membership **expiration date** can be found on your mailing label. Starting immediately, all dues received before June 30th will be applied to the current year if you are past due. If your dues are current, they will apply for the extended year of your current due date. Dues received and postmarked between June 30th and September 30th will be applied to the next year of membership.

KABT Membership Application or Renewal Form—ONLY USE CURRENT NEWSLETTER FORM!

Name: _____

(Mr.-Mrs.-Ms.-Dr.-Miss) First Name Last Name

Mailing Address: _____

City: _____County _____ State: _____ Zip: _____ - _____

School/Institution: _____

Position: _____

City: _____ State: __ Zip: _____ - _____

Phone: Work (____) _____ - _____ Home: (____) _____ - _____

FAX: (___) ___ - _____ Email Address: _____@_____

Enclosed Dues For KABT **$15** / Year—Life Membership Available For **$300**

National Association of Biology Teacher Dues: **$65.00** / Year

Dues Payment For Next Year Must Be Received Between Dates Of June 1st to September 30th

Dues Received On Dates Preceding June 1st Or After September 30th Will Be Applied To Current Year

Make Check Payable To KABT - Tax ID #: 48-0945206

Send Dues & Information To:

Kansas Association of Biology Teachers

18258 W. 157th Terrace

Olathe, KS 66062

Kansas Association of Biology Teachers

ALENDAR

Date Event

June 7, 2003	**KABT Spring Field Trip, Tallgrass Prairie Preserve, Pawhuska, OK (See details inside)**
Sept 12-13, 2003	KS Wildflower Society, annual meeting, Washburn Univ., Topeka
Sept. 20, 2003	KAS fall field trip, Z-Bar Ranch, Strong City
Sept. 20, 2003	KABT fall meeting, Barton County CC, Great Bend, KS
Sept. 26-27, 2003	Central Plains Society of Mammalogists, Bull Shoals Lake, MO
Oct. 3-4, 2003	KOS fall meeting, Winfield
October 8-11, 2003	NABT Annual Convention, Portland, OR
Nov. 13-15	NSTA Regional Convention, KCMO

Please send meeting dates and other items of interest to biology teachers to: Harry McDonald, 11917 W. 143rd St., Olathe, KS 66062, 913-897-9630 E-mail: biologycctrack@hotmail.com