Events Calendar for biology teachers, biologists & naturalists in Kansas

21-23 April 2006  KATS Kamp, Rock Springs 4-H Ranch, Junction City KS
22 April 2006    Kansas Entomological Society annual meeting, U. of MO, Columbia MO
28-30 April 2006 Kansas Birding Festival, Wakefield
29-30 April 2006 Kansas Herpetological Society spring field trip, Kiowa Co. [KW Co. St. Lake]
05-07 May 2006   Kansas Ornithological Society spring field trip meeting, Yates Center KS
03 June 2006     KABT spring field trip
08-10 Sept 2006  Kansas Native Plant Society annul meeting, Holton KS
16 Sept 2006     Kansas Academy of Science fall field trip
23 Sept 2006     KABT fall meeting, Cowley Co. Community College, Arkansas City KS
07-08 Oct 2006   Kansas Herpetological Society fall field trip
11-14 Oct 2006   NABT annual convention, Albuquerque NM
14 Oct 2006      Central Plains Society of Mammalogists, UCOK, Edmond OK
03-04 Nov 2006   Kansas Assn. of Conserv. & Environ. Ed annual meeting, Pittsburg KS
03-05 Nov 2006   Kansas Herpetological Society annul meeting, FHSU, Hays
07 Nov 2006      ELECTION DAY
12 Nov 2006      Kansas Citizens for Science annual meeting, City library, Topeka

For anyone interested in acronym explanation and/or further information, please contact Stan Roth <sdroth@ku.edu>. Also contact S.R. if you have other calendar events of interest to KS biology teachers, naturalists & biologists.

**Biology at KATS KAMP**

KABT will again present a strand of biology demonstrations and labs at KATS KAMP. Presentations will begin at 8:00 am Saturday, April 22 in Heritage A. Don’t miss out on the group of excellent teachers.
President’s Column

Todd Carter

“A professional is someone who can do his best work when he doesn't feel like it.”

- Alistair Cooke

Like any other group of professionals, as biology teachers we should be looking to build our professional networks, find better approaches, and uncover new resources. One way to further these goals is to become a member of a professional organization. The membership must not only provide a value to the individual, but should enhance or maximize the performance of the person in order to ultimately benefit the organization.

Getting the most out of any professional association membership is like anything else in life -- you're going to get out of it as much as you put into it. Fortunately, there are some easy steps that you can follow to ensure that your KABT membership is a success. Really think about what you're trying to get out of this membership.

• What are you hoping to accomplish?
• Is this about connecting to others of like mind? Is this about learning?
• Is it a social objective and a professional objective?

Establishing clear objectives by answering these questions will greatly benefit you in the long run. Working on committees or as a board member, hosting or helping plan events, helping coordinate programs, acting as a mentor -- that's where you are really going to develop learning and working relationships with other members.

By building substantial relationships you will also learn more about the resources within the organization. Additional professional organizations that your fellow members are involved in may be relevant to achieving your professional and personal objectives.

Professional membership confers a special status on those who hold it. A KABT membership can open a pathway to biology teaching professionals who are found around the state as well as those in the national and international community. Membership presents opportunities for community, professional recognition, and access to learning opportunities.

Being a part of a professional organization adds up to more opportunity for you, your career, and personal development.

Advantages of KABT Professional Membership:

• Large and prestigious organizational connections such as the National Association of Biology Teachers, Kansas Academy of Sciences, and the American Institute of Biological Sciences
• Access to the leadership in the profession
• Professional networking at local, regional, national, and international levels
• National, regional, and state seminars, workshops, and conferences
• Web Sites and listserv connections to resources and people
• Vendor Resource Information
• National and State Awards and Honors

There are lots of advantages to becoming a professional member. The true impact of a professional membership comes from your participation with the organization. KABT invites you to make a personal and professional difference. Join us at our first annual BioBlitz June 3, 2006 and then our Fall Professional Development Conference at Cowley County Community College September 23, 2006.

Explore Evolution at KU

The University of Kansas Museum of Natural History continues to exhibit an interactive evolution display in Dyche Hall. This is great for a student field trip as there are at least 12 stations for students to measure, observe, and compare data supporting evolution. Whales, finches, fruit flies, Diatoms, Primates, HIV and DNA are subjects for inquiry. Check it out.
**Newsletter Notes**

I have volunteered to edit the KABT newsletter not knowing the finer points of computing, especially Word or journalism. I concluded that old semi-retired teachers should learn new instead of watching Dr. Phil and Oprah. The largest job is really that of solicitor.

So like past editors I am requesting the information you have and would like to share with new and old Biology teachers. The following list of items are valuable to teachers.

- Labs – mini to AP types
- Reviews – CD, Books, software
- Student work – papers, labs
- Articles, web sites
- Pictures
- Conventions and/or workshops

Two more newsletters are planned this year; a late summer edition on August 15th and fall-winter edition on December 15th. Submit information by the end of the previous month. If possible submit articles in Microsoft Word format attached to an email. Send emails to pwakeman@mail.tong464.k12.ks.us.

**Editors Comments – The Power of Daylight**

Hooray for spring! Longer days, the semester is half over and melatonin levels should be on the rise (if you suffer from S.A.D).

Since early March I’ve been awakened at daylight by the energetic chorus of a Carolina wren. The pair has been around all winter but the singing started in earnest a few weeks ago. What stimulated this long song? About the same time I observed the gold finches feeding at a thistle feeder and the males are turning bright yellow. What causes the male bird to morph from a drab to colorful? Like clockwork around the first week of spring Eastern Phoebes arrived in my yard and started rebuilding their mossy nest near my garage door. They traveled 100’s of miles from their winter home in the south. The last of our winter residents, the slate-colored Junco, departed for Canada and cooler weather the first of April. What makes these birds migrate? What causes such a change in behavior or physiology? It wasn’t until my last undergraduate year at K.S.U. that I took Ornithology from John Zimmerman, this will “date” you too if you remember the Zoology Department located in Fairchild Hall. Besides doing a capture-release method on cockroaches for ecology class. I remember dissecting male reproductive organs from starlings caught in December and comparing to those caught in March. There was a significant increase in size and thus more hormones were flowing which triggered many behavioral and physiological effects. Oh the power of photoperiod. Birds are just one subject in a student’s environment that observations can be made and questions can be raised.

If you have time in your biology curriculum this spring (your not taking a state test) give your students the chance to observe and ask questions about the natural world. Take them outside to investigate the lawn, environmental area, or local stream. And with certain guidelines, allow them to bring nature to you (insects, herps, plants, etc.). Make collections in the fall or spring of insects or plants. Guide the students to ask questions a seek answers.

Whether its evolution, ecology or endocrinology, science seeks to understand the natural world. Help students be a part of this learning process and it starts with observing and asking question.
Sandy Collins is the 2005 OBTA Recipient for Kansas

Every year, the National Association of Biology Teachers (NABT) selects one outstanding biology educator in each of the 50 United States to receive its Outstanding Biology Teacher Award. This year the outstanding biology teacher in the state of Kansas is Mrs. Sandy Collins from West Junior High School.

In 1972 Sandy Collins started her teaching career in Hazelwood, Missouri. She has also been a research analyst and a guidance counselor. However, for the last 18 years she has been teaching Biology in the Lawrence School District. Sandy graduated from William Jewell College in 1969 with a Bachelor's Degree in Political Science. By 1973 Ms. Collins had received her Masters in Education from the University of Missouri. Sandy went back to school and in 1987 and received her Masters in Biology from the University of Massachusetts. Sandy Collins has been working as a Biology teacher in the Lawrence School District ever since. At West Junior High School she teaches four sections of Honors Biology and two sections of Biology. She also serves as a tennis coach and is the Chairperson for their Science Department. Sandy Collins's educational leadership qualities for the entire State of Kansas are illustrated by her serving as President, Vice President, and a Board of Director for the Kansas Association of Biology Teachers. She is also a member of the Kansas Association of Teachers of Science, National Association of Biology Teachers, and the National Science Teachers Association.

When asked about her philosophy on science education, Mrs. Collins states that "Students must see the relevance between textbook learning and life outside the classroom." This is why she uses electrophoresis labs to help her students investigate how DNA is used in criminal and paternity cases. One of her students describes another relevant learning experience involving bacteria: "...during our antibacterial unit, Ms. Collins had us test Staph's resistance to various antibiotics. The same day, the New York Times science section had an article discussing the various antibacterial tests using Staph." Does Sandy Collins' efforts to make biology relevant impact her students? The same student wrote "Before this year, science was neither an interest nor strength of mine. Ms. Collins has changed this." Another student writes "She's the reason I want to be a paleoarchaeologist." And yet another former student states "Mrs. Collins is the reason that I got my degree in Genetics."

Sandy Collins also believes that "A sound science education must provide the opportunity for students to develop analytical and cognitive abilities. This is best accomplished when students can gather and analyze data they have collected first-hand." To provide her students with this type of opportunity Sandy's class does many labs, several of which are hands-on authentic investigations. Past investigations include students tagging monarch butterflies and then monitoring both their migration patterns and their population size. Ms. Collin's students also collect, test, and analyze the water from a local river noting changes and the ecological impact from those changes. Another hands-on field activity that Ms. Collin's students work on involves counting and identifying different kinds of plants on various sized plots on their campus to determine the species-area effect. They then apply this information in a "real world" setting by trying to determine how the proposed South Trafficway in her community would affect the local wetlands. As you can see Sandy Collins truly believes that she can "best help (her) students learn when they are actively engaged in the learning process". A parent agrees saying "From these real problems Mrs. Collins was able to generate valuable interaction between her students, herself, and the environment. This kind of interaction enabled my daughter to get excited about science."

Once Sandy has her students excited about learning, she believes it critical that they understand biology because: "More than ever, a sound understanding of basic biological principles is required to make intelligent decisions about issues we face in both our personal lives and as responsible citizens." She also hopes that the meaningful information that she provides her students will help them "foster an appreciation of and enthusiasm for the beauty and complexity of the living world."

Following the best aspects of the "No Child Left Behind" philosophy, Mrs. Collins works hard to reach all her students. A colleague states "Sandy is able to reach student with a wide range of abilities. She has taught several National Merit semifinalists and finalist. She has also had success with students with severe emotional needs and learning disabilities." Sandy's Principal agrees: "Sandy is excellent at differentiating instruction to meet the needs of all students. She has demonstrated the ability to reach the difficult student, while continuing to challenge those who excel in science." Of the many reasons that Ms. Sandy Collins is a great biology teacher, maybe this is the most important. As Sandy says herself: "I do love my job, which is actually not a job but, as most teachers will confess, a mission. Over the years, I have had the opportunity to work with both very motivated kids and kids for who, tragically, school is not any part of their lives. I have learned from them all. And I hope, with all of my heart, that I have provided the opportunity for them to learn about the beauty of the living world."

For her expertise in biology, her enthusiasm in the classroom, and her devotion to both her students and the entire biology education community, Mrs. Sandy Collins was selected as the 2005 Outstanding Biology Teacher Award recipient for the State of Kansas.
OBTA Nominations

Dear Colleagues,

I am writing to you on behalf of the National Association of Biology Teachers. As the director for the State of Kansas, it is my hope that you will have a worthy candidate for the Outstanding Biology Teacher Award. If you know of a colleague who has been teaching for at least three years and fits many of the characteristics listed below, you should consider nominating them.

Good teaching always requires a lot of hard work. Teaching science skillfully requires an even greater amount of time and effort. Especially now when science seems to be under attack, good science teaching in Kansas needs recognition! I realize that the reason most teachers stay in the classroom is because they love teaching, they love their students, they love their subject, and they believe in the power of education. And while its obvious that no one enters education for the money or the recognition, isn’t it gratifying to know that someone recognizes your efforts. This is especially true if that someone is a fellow biologist.

Please send the nomination letter to:

Patrick Lamb
OBTA State Director
Manhattan High School
2100 Poyntz Ave.
Manhattan, Kansas 66502

Characteristics of an Outstanding Biology Teacher

Teaching style/Approach
An excellent teacher:
1. Is enthusiastic about teaching students the subject matter
2. Treats students with respect and designs curricula to meet the needs of all students, regardless of level of instruction
3. Relates subject matter to students' lives, explaining how they are an integral part of the entire ecosystem
4. Sets an example of integrity inside and outside the classroom and teaches students responsibility and high standards
5. Plans lessons well in advance, gives adequate time for each topic, and integrates subjects (e.g. Science, Technology and Society)
6. Teaches well organized concepts in a conceptually concise fashion
7. Stresses concept learning rather than rote memory
8. Continually reassesses approaches, lectures and test to insure a fresh, relevant curriculum
9. Exhibits inquiring behavior typical of scientists.

Subject Expertise/ Teaching Techniques
An excellent teacher:
1. Teaches students how to learn, analyze and think critically, emphasizing good scientific methodology and problem solving skills
2. Prepares lessons that will enhance problem solving skills
3. Develops hands-on activities to illustrate concepts and uses a variety of approaches to assist the learning processes--lectures, discussions, laboratories, demonstrations, field trips, guest speakers, student presentations, films and slide shows
4. Keeps up-to-date in the subject matter
5. Maintains competence in the life science fields
6. Teaches useful lab techniques and lab safety
7. Stresses the fragility of life on the planet and the importance of maintaining well managed ecosystems.

Teaching Environment
An excellent teacher:
1. Creates an exciting classroom atmosphere with as many living things as possible to enhance learning (e.g. well maintained plants and animals, which may include fish tanks, gerbils/mice, reptiles/amphibians)
2. Acquires up-to-date equipment for laboratory work
3. Joins committees to improve the school, department, himself/herself
4. Generates new and exciting ideas for students to think about
5. Encourages students to ask questions about lesson
6. Maintains a safe and clean classroom laboratory
7. Knows how to administer first aid in case of an accidents.

Community Involvement
An excellent teacher:
1. Will use the community resources by inviting guest speakers from nearby institutions and conduct field trips to laboratories, nature reserves, museums, local water plants, etc.
2. Develops and promotes advanced and/or continuing education courses in the school district, if possible
3. Attends other activities in which students are involved such as musicals, sports, art exhibits, etc.
4. Takes an interest in and gets involved in community activities
5. Solicits support from community businesses to improve facilities and programs in the schools.

Professional Development
An excellent teacher:
1. Continually updates his/her knowledge by
   a. Reading the literature (e.g. journals such as The American Biology Teacher, Scientific American, Science, Science News, etc.)
   b. Attending conferences, conventions, workshops and encourages colleagues to join as well
   c. Visiting local laboratories, nature reserves, etc.
2. Becomes active in a professional organization and encourages colleagues to join as well.
3. Seeks grant support to purchase equipment, to organize or attend meetings or conferences, and to fund special educational projects
KABT BioBlitz

Fellow Biology Teachers,
KABT spring field trip is a long standing tradition as a leader in life science instruction at a state and national level. The problem is KABT is well known by too few Kansas biology teachers. It is my hope to provide opportunities for Kansas Biology teachers to share in this legacy and build anew the connections with in the state, regional, and national organizations.

The KABT board at its winter meeting, in early February, decided to meet at Kanapolis Lake to conduct a BioBlitz. We think we have a winner that has a lot of potential to turn into a KABT tradition, bring in new membership and be a service to the state of Kansas. Do a google search on BioBlitz to see how effective these events are. A BioBlitz is a concerted 24 hour effort to document the biodiversity in a specific area—they are a lot of fun but require quite a bit of pre-planning.

The board designated Randy Dix (me) the leader and Brad Williamson the unofficial assistant. Planning and coordination for the BioBlitz is conducted on the Teaching Biology Blog. I encourage every biology teacher to visit this site. http://teachingbiology.blogspot.com/ Each board member is requested to post entries and to make comments. Other biology teachers and readers are encouraged to comment as well. We are just getting started and so far only a couple of board members have begun posts. This blog can be a great resource and community for biology teachers. Because we are all busy we are asking each board member to try and make one post a week. The posts can be about the BioBlitz, KABT, or just plain old biology teaching in general. Check out the site, you’ll find all kinds of posts.

Back to the spring field trip: The planning for this field trip may be dying a death of neglect. It’s a little late in the year to take on a project like this and maybe we really need to wait a year. We are all very busy but decisions must be made and action is required due to the nature of this particular trip.

I am requesting --
· The time be changed to June 10th (I have a conflict on the original date.)
· We need taxon leaders to step forward on the blog, make a commitment to attend the field trip, ‘bring resources’, and be the expert or bring one in the field.

A little back ground on a BioBlitz was posted on the blog and the example of this site given. http://www.fieldmuseum.org/bioblitz/index.html

As the leader I need these jobs filled:
· Site permits, camping/accommodations at Kanopolis—Brad Williamson
· Volunteer to lead the Collection and identification of the following taxon and bring or serve as the expert scientist.
  Aquatic invertebrates
  Soil macroinvertebrates
  Birds---
  Mammals---
  Reptiles/Amphibians---
  Insects-
  Mosses, liverworts and ferns
  Flowering Plants--
  Fish--

Is KABT fulfilling the needs of the biology teachers of Kansas? Have we provided materials or activities that make joining this organization a positive experience? Based on attendance and revenue the fall biotechnology workshop of 2005 can be considered a success. Attendees received content that may be of use in their classroom and new members joined. However we haven’t followed up. The spring/summer field trip is an opportunity to give to our members and to the education of Kansas biology students.

Board members: let me know, soon, if you can help. Otherwise we need to reconsider this year’s plan and introduce the BioBlitz concept, next year with more time for planning and preparation.

Randy Dix
Qualified Admissions Criteria to be modified; open hearing April 25

Of the many recent Kansas education reforms, the only one to have a substantial positive impact in the Kansas science classroom has been the Board of Regents Qualified Admissions criteria. Put into effect for HS freshmen entering 1997 and graduating May 2001, the QA natural science requirement of three HS sciences to include at least one chemistry or physics, produced a lasting biology teacher shortage by pressing all biology teachers who were licensed for chemistry or physics into those classes. Most critically, the high school general and physical science courses, often taught by teachers with minimal science training, were no longer accepted for admission to Kansas regents universities. These requirements then dovetailed with "Redesign" where high school licensures in general science and physical sciences were eliminated in 2003.

The QA criteria were not well accepted by many Kansas superintendents and principals who wanted to continue using general science and physical science as college-prep courses. The rationale for this was based on the large number of such teachers in the system who can continue to renew the old certification. Several KSDE meetings were held where superintendents advocated loosening the QPA criteria. KABT member Bill Welch testified to maintain strong science teacher preparation under the new QA criteria. While these meetings reached an impasse, continue pressure has been applied to weaken the rigor imposed by QA.

An open meeting to discuss the draft regulations for qualified admissions has been scheduled for Tuesday, April 25 at 2:00 in the KBOR Board Room. The current revised draft of the regs consists of 19 separate regulations. Beware of attempting to read a single regulation in isolation; other regulations (especially the definitions) may impact the interpretation of a given regulation.

Following the public forum, the next step is to send the regulations to the Department of Administration for review of the wording... Several episodes of "back and forth" are likely before the Department of Administration will sign off. During this process, changes in the intent of the regulations can still be made. However, the process will be greatly facilitated if there is early agreement on the intent of QA.

There are many points of interest for veteran biology teachers. There are implications in the following areas:
- botany and zoology, etc. are included in the biology concepts; there may be attempts to remove them.
- while there is a need to decide what to do with students transferring from other states, 'functional equivalents can be used to erode QA.
- there are proposals where taking a test can substitute for taking a course; students learn biology in coursework, not test preparation, and this policy could result in smaller rural schools no longer needing a science teacher but merely someone to coach them for the test.

Kansas has been a strong state in scientist and science teacher preparation because of the relative rigor of our teaching requirements relative to broadfield states. Under Commissioner Droegemueller, food science (home ec) and tech prep cold be the two required science courses. We have come a long way since then and this is no time to backtrack. The good people at the KBOR need your experience and input.

Richard Schrock
Spiders: An Organism for Teaching Biology

by Debra Scheidemantel

In this unit, the students explore basic ecology concepts and scientific processes using spiders as model organisms. They capture spiders, observe and care for them, and use them to answer their own questions about spider behavior. Modeling the process of a research scientist, each team of students designs and conducts their own experiment. Simultaneously, the class collaborates on joint projects investigating feeding rates of spiders (by pooling individual feeding data) and their importance in controlling the numbers of insects (by conducting a field study on or near school grounds).

The unit includes both teacher and student materials. The teacher materials include teaching tips, scheduling timelines, preparation instructions, and resource materials. The student materials include the lab handouts the students will be using in each of their experiments.

note: All of the spider graphics contained within this unit were drawn and copyrighted by Debora Scheidemantel

Spiders: An Organism for Teaching Biology

Collecting, Keeping, and Caring for Spiders

Collecting

Collecting spiders is easy. They are found everywhere; you may not even need to leave your house! The equipment can be as simple as a jar with a lid. In fact, I catch most of my spiders by stalking them with a jar. Collecting is fun, and you will certainly want to move outdoors too. Many species of spiders can be found through all seasons of the year.

1. Look in a variety of habitats. Window sills, cracks and corners inside and outside the house, on trees and bushes, on grass, in washes, in the desert, in the mountains, near streams, ponds, under rocks, in leaf litter.
2. Look day and night.
3. Use a sweep net in tall grasses.
4. Use a light colored tarp and beater to knock spiders out of bushes. Like insects, many spiders will drop out of vegetation when pursued. Put the tarp where they will fall.
5. Fishing spiders may hide in drifting debris close to the edge of water. They may hide along the edges of swimming pools.
6. Spiders in leaf litter can be sifted out with a mesh. Another technique is to put the litter in a funnel over a jar. Adjust a warm light overhead and the heat will force the spiders down the funnel.
7. Some wandering spiders can be captured with pit traps. Try a glass jar or old soup can buried in the soil with large leaves or something to camouflage the opening. You want something with steep slippery sides so the spider can't get out.
8. Look for webs. Always place your jar below the spider to catch it because they tend to drop when pursued.

Keeping and Caring for Spiders

Spiders are really easy to keep and care for. They require very little space and feed usually once or twice a week.

1. Place.
The container you keep your spider in may be as small as a three inch vial or as large and fancy as a terrarium. If you wish to observe natural behavior then you will want to provide the spider with space and habitat similar to the one from which it was collected.

You don't need to purchase anything, a plus for classroom use. Old mayonnaise jars, large clear containers minus contents from Price Club, yogurt cups with clear lids, old picture frames for web spinners, etc. are just a few ideas. Decorate the container with materials you collect from outside: twigs, dirt, sand, dry leaf litter, rocks, dry grass, etc. For a touch of color buy a few silk flowers at a yard sale or McFrugals.

2. Feeding.

Food can be provided relatively easily, a must for busy teachers.
a) Fruit flies are suitable for most spiders, although many spiderlings cannot grow up on them alone. Fruit flies are easy to get and maintain. Save them from your genetics experiments. Ask the fly lab at your local university for their leftover flies. Keep them going with moist food. Fruit flies will eat almost any leftover scraps of moist food, especially fruit (no surprise). You can also make a less smelly food with Jell-O, corn meal, oat meal, and sugar or honey.

b) For larger spiders, try raising house flies. Leave out some moist cat food, dog food, or fruit to attract flies. They will lay their eggs on the food. When maggots start growing, you can start your colony!

c) Large spiders such as wolf spiders, tarantulas, and *Phidippus* can eat grasshoppers and crickets. Students can catch these for you. Crickets can also be purchased at most pet stores.

d) Have students catch different insects and see what the spiders will eat.

e) Some spiders need water. This can be provided in a small dish or a in a moist piece of cotton or tissue. Many desert jumping spiders do not need the extra moisture; they get all they need from their food.

Preserving Specimens

If a spider dies or if you wish to build an archive collection, you will need to preserve specimens. Spiders are very soft bodied and shrivel terribly if left to dry like insect specimens. It is best to put the spider in alcohol in a vial. 95% ethanol is best, but I have found that 70% rubbing alcohol from the grocery store works well too, especially for classroom use. Store your spiders with labels, either done in alcohol-proof ink or pencil. Include the following information on the label: date captured, location, collector, and identification if known.
1. Add a prey item to your spider's habitat. Observe your spider and record its behavior on a separate piece of paper for 15 minutes. Write down everything you see it do.
2. Look at your spider under the dissecting microscope. Make a sketch large enough to fill most of the page. Label all of the parts of the spider you can.
3. Is your spider male or female? How can you tell? Indicate this on the sketch.
4. Look at the Golden Guide or How to Know the Spiders book to see if you can find out what kind of spider it is. Write this down at the top of your sketch.

**Second Observation**

1. Add a prey item to your spider's habitat. Observe and record your spider's behavior for 15 minutes.
2. Think of as many questions as you can about your spider based on what you have seen. Write them down.
3. Be prepared to show your spider to others in the class and to say a few words about what it looks like and what it does.
4. Write down one word that best describes what you have seen your spider do. Write this word on the board. What other words were written on the board? Is there a pattern? Are some spiders more active than others?
5. Can spiders be grouped (categorized) based upon their behavior? Explain.

**Making Accurate Descriptions**

*Adapted from BSCS Investigations 1.1*

*The Powers of Observation*

1. Work together; your lab table is a team. Observe your spiders together and discuss the similarities and differences you see in them. If appropriate, take measurements.
2. Choose one of the spiders and describe it. Have one person write down the description. Do not include any information about the container, just the spider. On a separate piece of paper write down the lab station number and which spider was described.
3. When your teacher signals, place the description and spiders in the middle of the table.
4. When your teacher tells you, rotate to the next table. Read the description and decide as a team which spider it refers to.
5. Prepare a chart with the headings: lab station number and spider fitting description.
6. Continue to rotate when your teacher tells you until you return to your starting point.
7. Your teacher will write the correct answers on the board. Check your table against this list. If your conclusions do not agree with the list, recheck the group of spiders and observations. Did you miss anything? Was the description complete?

**Discussion**

1. Which was easier: writing a clear description or selecting the specimen another team had described? Why?
2. For each description, what information could be added to make it more clear?
3. For each description, what information could be removed and still leave the description clear?

In what ways did reporting and verifying observations in this investigation increase your knowledge about spiders?

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The University of Arizona  
Department of Biochemistry and Molecular Biophysics  
General Biology Program for Secondary Teachers  
warder@email.arizona.edu

http://biology.arizona.edu/sciconn/lessons2/lessons.html  
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KABT Fall Conference Pictures

Paula Donham (pictured left) and Randy Dix (sorry Randy no picture) sponsored the fall conference at Olathe North High School. Electrophoresis, PCR, and protein structure were topics of labs and discussion presented to more than 30 participants.

A pair of professional pipetters pipetting proteins! Pat Lamb (pictured left) and Todd Carter (pictured above).

If you have pictures of biological interest from your classroom or conferences you attend, send to editor at pwakeman@mail.tong464.k12.ks.us
TODAY’S ISSUES...

TOMORROW’S SOLUTIONS.

Transforming LIFE SCIENCE EDUCATION

The 2006 NABT Professional Development Conference and Exhibition
October 11-14, 2006, Albuquerque, New Mexico

WWW.NABT2006.ORG
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