Kansas Association of Biology Teachers

Volume 37 Number 4 & Volume 38 Number 1 — February 1997
Editor: John Wachholz

NEWSLETTER

Calendar & Activities

Please mail, e-mail or phone meeting dates and other items of interest to biology teachers to John Wachholz, 2311 Applewood Lane, Salina, Kansas 67401-3707, 913- 825-7742 (Home) 913 - 826-4751 (School). E-Mail: jwachholz@midkan.com

Date	Event
April 3-6, 1997	National Science Teachers Convention - New Orleans, LA
April 11, 1997	KS Academy of Science - Annual Meeting - KSU, Manhattan
April 25-27, 1997	KATS Kamp - Rock Springs 4H Ranch
April 25-27, 1997	KS Ornithological Society - Spring Meeting - KSU , Manhattan
May 10, 1997	KABT Spring Field Trip Meeting - Northern Red Hills - Belvidere
June '97	Possible Canoe Trip To Niobrara River - Valentine, NE
Fall '97	KABT Fall Meeting - Fort Hays State University
October 8-11, 1997	NABT National Convention - Minneapolis MN
May 9, 1998	Spring Meeting & Field Trip - Kanopolis Reservoir Area
Summer 1998 Tentative	Picket Wire Canyon Trip - SE Colorado
September 19, 1998 Tentative	KABT Fall Meeting - Wichita

More Information On KABT Spring Field Trip In Your Next Newsletter

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Brad Williamson who teaches at Olathe East High School is our regional representative to NABT. Contact Brad via Fax at (913) 780-7137.

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Your membership **expiration date** can be found on your mailing label. All dues are now payable on September 1st of each year. If an envelope was enclosed with your newsletter your membership has expired. Please use the envelope to mail your dues and the other information requested. A registration form appears on the last page of this newsletter.

Coming Soon KABT Web Site

This is in the process of being designed and should be up and running by the next

Newsletter Is A Joint Issue

This newsletter is a joint issue covering Volume 37 Number 4 and Volume 38 Number 1. The reason for this is that your editor failed to get V37 N4 published in time. Sorry about that. My hope is that this issue contains enough information to make up for my lack of production.

PUBLISHING DATES FOR NEWSLETTER

The newsletter is published during the months of September, November, February and April. Manuscripts must reach the editor by the 15th day of the previous month. The KABT Newsletter includes abbreviated minutes of the official meetings, announcements of future activities, brief news notes, and other brief items of interest to biology teachers. Send your contributions to John Wachholz, Editor, 2311 Applewood Lane, Salina, KS 67401 (913) 825-7742. You may send you information for the newsletter to jwachholz@midkan.com.

Newsletter & Journal Information Needed

Articles are needed for the newsletter. Please help with the newsletter. The most helpful occurrence would be for all individuals to send information to the newsletter. Send it via internet to jwachholz@midkan.com or on a disk. If you send it on a disk, any format is acceptable. Your help is appreciated. (PC, Mac, Apple - just send it!) Articles for the Kansas Biology Teacher should be sent to John Richard Schrock, editor KBT, Division of Biology, Box 50, Emporia State University, Emporia, KS 66801-5087. Keep your dues up to date so you will continue to receive the Kansas Biology Teacher.

Outstanding Biology Student Certificates

These are available for students who you feel have completed a biology course under you and have shown outstanding achievement. Send your name and address to KABT Student Certificates, 2311 Applewood Lane, Salina, KS 67401-3707.

Please use these certificates as valuable awards for outstanding students.

NABT Contact Information

Address: 11250 Roger Bacon Drive #19, Reston, VA 22090-5202

Phones: 703-471-1134; 800-406-0775

Fax: 703-435-5582

E-mail: NABTer@aol.com

From Your President

Dear KABT Members:

As my tenure as your president begins, I am looking forward to a very exciting two years. I believe the future of KABT will continue to be as strong as ever. I hope we can keep the fine tradition of improving biology teaching across the state by our sharing and learning from each other.

While I have a few ideas and plans for KABT over the next two years, the ultimate success of KABT can only be determined by its membership. Please be an active member of KABT. Make time and take time to get involved. Your participation as a member of KABT is crucial for its growth and success. Articles or items of interest are always needed for the newsletter. Please forward them to John Wachholz.

In the winter board meeting (January 25, 1997), we discussed the =97 spring field trip, state science assessment tests, and other items of interest. If you have any ideas, suggestions, or advice, please share it with me so it can be brought up at the spring meeting.

Have a great school year and continue spreading your love for biology to all your students to keep them excited.

Terry Callender

Candidates Needed For Directors At Large

Two openings exist on the KABT executive board. They are directors at large. If you are interested in serving please contact Terry Callender.

OBTA Award - 1996 - Kansas

Congratulations to Harry E. McDonald II who is the Outstanding Biology Teacher for Kansas. Harry teaches at Blue Valley High School, Stilwell, KS.

Spring 1997 - Field Trip Meeting Belvidere, Kansas - May 10, 1997

Belvidere is a small, unincorporated town in southwestern Kiowa County. It is more or less, equidistant from Pratt, Medicine Lodge, Greensburg and Coldwater. These towns have motels, restaurants, grocery stores and gas stations.

We will plan to meet at the Belvidere City Park (behind the Trails End Junk Shop) at 8:30 AM, Saturday, May 10th. Some of us will drive in Friday evening the 9th and camp at the park for no fee. There is potable water and pit toilets along with adequate flat ground for tents and campers.

Plans for the day will begin with a look at the upper Thompson Creek wetland to find Arkansas Darters (bring aquatic-dip nets) and wee beaver dam communities. We will proceed through the mixed grassland pasture areas to study the Cretaceous upthrust through the surrounding Permian rocks. The Champion shell bed will have collectable fossils. We will tour the area of Cheyenne Sandstone outcrop south of Belvidere and hike the deep ravines. Lunch time will happen around this period so plan to have this available. We will divide into two groups and one will tour Hells-Half-Acre in northeast Comanche County and the other group will travel to Triple Arch cave in Barber County.

Ken Brunson from the Pratt office of Wildlife and Parks is planning to conduct his annual herp count at the time of our meeting and has agreed to assist us. We can also assist him as we conduct our meeting.

For those that might stay Saturday evening, this part of Kansas can be very productive for hearing and seeing nocturnal ecology via road cruising pursuits. We could get out a bit on Sunday the 11th before heading back home.

One last thing. We will travel between study areas via car pooling. If you can bring a CB radio for your vehicle, we will monitor and share via channel #4.

- Bring Your Own Provisions
- Private Land - No one goes back later - respect.
- Bring Flashlights
- It is Mothers Day Week-end.
- Final Info in April Newsletter

Stan Roth, Meeting coordinator, Lawrence High School, 1901 Louisiana St., Lawrence, KS 66046-2938. (913) 832-5050 ext 252 or FAX (913) 832-5054. email: jroth@falcon.cc.ukans.edu.

Special Sessions At KATS By KABT

Session Title: Strategies for Preparing Students for the 10th Grade Kansas State Performance Assessment

KABT members will present open-ended labs and strategies that will help successfully prepare your students for the Kansas State Performance Assessment. This will be a workshop format. We'll focus on cheap but rich, open-ended labs that model the state test. Make the assessment valuable for you and your students. — Hands-On — High School

Session Title: Kansas State Performance Assessment: What do we do next?

KABT will sponsor a panel discussion that will serve as a problem solving session on strategies for district implementation, scoring, and logistics of the state assessment. Come and share how you and your school handled the logistics of the last fall's performance assessment. What should we do during the "off" year. How could we improve the rubric for scoring? The purpose of this session is to begin a draft of recommendations for the Kansas State Board of Education regarding future state performance assessment. — Panel Discussion and Break Out Strand — High School Science

Regents Life Science Requirements

Curricular Area: Natural Sciences

3 Units Required

* Must include three (3) units chosen from biology, advanced biology, chemistry, earth/space science, and/or physics. At least one unit must be in chemistry or physics.

* Up to two units in Applications in Biology, Applications in Chemistry, and/or Principles of Technology I and U may be counted on a "one unit for one unit" basis provided that they are:

1) comparable in content to the curriculum outlined by the Center for Occupational Research and Development;
2) taught by teachers certified by the State Board of Education to teach biology, chemistry and/or physics; and
3) approved by the Commissioner/Kansas State Department of Education as equivalent in content to high school biology, chemistry, and physics courses.

Applied/technical courses may not substitute for the requirement that one unit of natural science credit must be in chemistry or physics.

* *

The Board of Regents also recommends that students take one (1) additional unit of science in high school chosen from biology, advanced biology, chemistry, earth/space science, or physics.

* All courses must include applications of teaching strategies, instructional design, materials, technology, and laboratory investigations so that students will achieve the content knowledge and scientific problem-solving processes specified in the *Curricular Standards for Science, Grades 9 - 12* established by the Kansas State Board of Education. Units in natural science must be designed and taught to average at least one laboratory experience per week.

KACEE HISTORY

The Kansas Association for Conservation and Environmental Education-- formally the Kansas Advisory Council for Environmental Education --

(KACEE) was established in 1969 for the purpose of promoting effective environmental education throughout Kansas. It was established as an organization made up of representatives of various agencies and organizations with an interest in supporting environmental education. It was recognized that KACEE could not become involved an advocacy on specific environmental issues, but rather would promote a full understanding of the various sides of environmental issues through the educational process.

One of the purposes of KACEE was to serve as an advisory group to the State Board of Education in matters of environmental education. The 1978 Kansas Legislature passed House Concurrent Resolution 5004 in support of the environmental education. This resolution directed the State Board of Education to support and promote environmental education programs in Kansas school districts and the State Board of Regents to emphasize environmental awareness in the teacher preparation programs. It further requested that the State Board of Education officially recognize KACEE and consult with the Council in preparing a comprehensive statewide plan for environmental education.

In August of 1978, the State Board of Education officially recognized the Kansas Advisory Council for Environmental Education and authorized State Department of Education in cooperation with KACEE to formulate and carry out a statewide environmental education program through development of a comprehensive state plan. In addition to the plan, the Department and KACEE were to have the responsibility of assisting school districts and agencies in planning and organizing local environmental education programs.

During the years since its formation, KACEE has developed a series of programs that have has a positive impact on environmental education in the state. Biannual meetings have provided an opportunity for exchange of information and ideas about environmental education programs and activities.

Beginning in 1975, KACEE in cooperation with Kansas State and Extension Forestry sponsored a series of Interdisciplinary Environmental Education Workshops based on a series developed by the USDA Forest Service. Over 1000 teachers, resource professionals and youth group leaders have been trained in the process and problem-solving approach to learning, using the environment as a teaching vehicle.

In recent years, KACEE has been the recipient of several environmental education grants from Vulcan Chemical Company of Wichita. These grants have also been used to underwrite the cost of Project WILD and Project Learning Tree facilitator-training workshops.

KACEE also publishes a quarterly newsletter which provides information on new developments, resources and events in the environmental education field. Corporate contributions from Western Resources, Inc. and have helped to underwrite the cost of the newsletter.

In the spring of 1996, the membership adopted a new set of bylaws that changed the name of KACEE from the Kansas Advisory council for Environmental Education to the Kansas Association for Conservation. The name change recognizes that KACEE will continue to serve in an advisory capacity to the State Board of Education, but its function and mission have expanded far beyond that of just an advisory council.

KACEE membership has expanded to over 100 organizational members and an equivalent number of individual memberships. KABT has been an organizational member for most of KACEE's history.

KACEE is continuing to work on establishing a base level of funding to support an Office or Environmental Education and the position of Executive Director. The office was established by an agreement between KACEE and Kansas State and Extension Forestry (KSEF) through which KSEF will provide office space and secretarial support for the Executive Director position. John Strickler is serving in the position on a half-time basis with much of his other time as voluntary.

Governor Bill Graves recommended $25,000 base funding through the Department of Education budget in this FY 1997 proposal. After approval by the Kansas Legislature, the funding source was shifted to the State Water Plan Fund which makes uncertain the prospects of continued funding in subsequent years. KACEE matched the state funds dollar for dollar.

Other developments should strengthen KACEE's role in state environmental education programs. KSEF has contracted with KACEE to take over the delivery mechanism for Project Learning Tree. The Governor recommended and the legislature approved Project WET for $50,000 from the State Water Plan fund FY 1997. KACEE is negotiating to assume responsibility for implementing Project WET in Kansas.

The broad network of public and private organizations represented by KACEE's membership put it in an excellent position to seek support for

environmental education both within its membership and from outside sources. If KABT members have questions or comments concerning KACEE and its programs contact myself or any officer. I would like to explore each of the programs in future newsletters.

Thanks to John Strickler for providing this KACEE history.

Pat Wakeman

KACEE Representative

Eastern Kansas Trails in Peril

Do we want a 237 mile interconnected trail system in eastern Kansas? Do we need trails in Kansas? Will people use the trails?

Due to a lack of written response from trail supporters around the state, many people, including legislators, are debating these questions right now. The 1997 legislative session will be deciding if they should allow the Prairie Spirit Trail, a 50 mile hiking and bicycling trail, to join with the state park system and be funded in part from revenues from the park fee fund instead of state general funds.

The Prairie Spirit is a pilot project of the Kansas Department of Wildlife and Parks and the state of Kansas to test the need and support of trails in Kansas. The first 18 mile section of trail opened in March of 1996 and trail use has been increasing steadily, the second 15 mile section is scheduled to open in September of 1997.

The Prairie Spirit Trail and the 37 mile Landon trail both connect to the 150 mile Flint Hills Nature trail in separate locations. The Landon and Flint Hills Nature trail are both operated by the Kansas Horseman Foundation, though not yet fully developed, the land is set aside and is being developed as a trail as funding becomes available.

Some opponents want the public to think that the government has violated their constitutional rights and stolen the trail corridors. Though few in number, trail opponents have been very vocal and have written numerous articles trying to rally farmers and landowners against the trail projects which have resulted due to a process called " rail-banking".

Tested in 1990 by the U.S. Supreme Court, rail-banking was found to be Constitutional. Rail-banking allows out of use rail corridors to be turned over to management agencies and used for public trails. Without rail-banking, these corridors would be abandoned and under current state law the corridors would be given to adjacent landowners.

With rail-banking, these corridors remain valuable intact Greenways with many recreational opportunities. Rails and ties are removed and an improved trail surface is put down to allow accessibility. Federal gasoline tax dollars have paid for 80% of the construction costs of the Prairie Spirit and state funding has been aided by local efforts for the remaining 20%. In the event of an energy crisis or national emergency these corridors could easily be reverted back to rail travel if needed, but until that time the corridors can be used for non motorized travel.

Newspapers and legislators need to hear support for trails in Kansas. Bombarded by the steady stream of letters from trail opponents, it would be easy for legislators and the uninformed public to get the idea that there is no need for trails in Kansas.

For information about the Prairie Spirit Trail, please contact: Friends of The Prairie Spirit Trail P. O. Box 71 Garnett, KS 66032

Please contact your local newspapers and representatives and let them know you support trails in Kansas. To find out how to become more involved contact (913)448-6767. This is KDWP's Prairie Spirit Trail office, it is located in the Garnett Chamber of Commerce office.

The Nuts and Bolts of Rail Banking

In 1983, Congress passed section 8(d) of the National Trail System Act Amendments which created a process called " Rail Banking ". Due to the decline of rail use in some areas, railroads were removing tracks and " abandoning " rail corridors.

Under Kansas law, as with many other states, once a rail corridor is abandoned the land owners adjacent to the rail line split the rail right-of-way and it becomes their property and unusable again to rail travel or other uses without the repurchase of the property. Under rail banking, the corridor is managed by a government or other qualified private organization and the corridor is maintained intact and opened to the public for trail use. Tracks and ties are removed, but bridges and culverts are left in place and a suitable trail surface is put in place. The Act specifically stated that rail banking would not be considered an abandonment, and in the event of a national emergency or a need for rail travel in the future due to possible energy shortages, the right-of ways could again be used for rail travel .

In 1990 the U.S. Supreme Court upheld the Constitutionality of rail banking in Preseault v. ICC . In November of 1995, in Preseault v. United States the U.S. Court of Appeals again upheld the Constitutionality of rail banking.

The 1995 Preseault case is widely used by trail

opponents. The Court found that in the specific instance of the Preseault case a "Taking" had occurred and the Presaults could take their case to the Court of Federal claims for possible compensation.

Other key points of this Vermont based case decided by the Courts;

All corridors which are presently railbanked will remain railbanked. The Preseault decision is about compensation, not about the legitimacy of the railbanking law itself.

The Court found that responsibility for compensation lies with the U.S. Government, not the trail manager, the railroad or state of Vermont .

This decision sends the case back to the Court of Federal Claims to determine the amount of compensation, if any, the Preseaults are entitled to.

This decision focuses narrowly on Vermont law, and is therefore limited to railbanked corridors in Vermont.

This decision does not affect rail corridors in which the railroad held fee simple titles, rather than a railroad easement, to the property.

Adjacent property owners who allege a taking of private property as a result of railbanking can only seek remedy in the Court of Federal Claims --they cannot have property returned to them, nor can they demand that the trail be closed or dismantled.

Kansas Rail Banked Corridors

There are currently three major rail banked corridors in Kansas. The Prairie Spirit Trail, 50 miles in length, The Flint Hills Nature Trail, 150 miles in length, and the Landon Trail, 37 miles in length. The Landon and Prairie Spirit Trail both connect to the Flint Hills Nature Trail in separate locations.

There are several other small one or two mile railbanked corridors in Kansas, these have been made into parks and are generally within city limits.

In the 1980's alone over 825 miles of rail corridors were abandoned in Kansas. Valuable trail possibilities and future energy efficient transit possibilities were lost forever.

The Prairie Spirit Trail

The Prairie Spirit Trail is considered by Governor Graves, the Kansas Department of Transportation, and the Kansas Department of Wildlife and Parks to be a pilot project for trail construction and needs in Kansas. The first state operated "rail trail " in Kansas, it is being used to test public and political support of trails in Kansas. If the Prairie Spirit Trail is a success, there may be more additions in the future, if it is not, it will possibly end the development of these trails by the state in Kansas.

The trail is 50 miles in length and travels through a corridor which is 100 feet wide in most areas, but extends to 200 feet wide at some locations. The trail is a valuable Greenway which supports a wide variety of plant and animal life.

Opposition

Although few in number, true trail opponents are very vocal and tend to rally together those who are uninformed about trails or railbanking with petitions and letters explaining that the Government is "Confiscating" private property, stealing land from farmers and violating their Fifth Amendment rights. Opponents tell of the criminal element associated with trails and the countless vandals, hoboes and homeless which will move in with the trail. Opponents advise the uninformed that crime along trails will skyrocket, making life along the trail a hardship for landowners and their property a target of destruction. Opponents have been quoted in papers such as the Topeka Capital Journal as saying there's nothing to see along the trail but " brush and grass " anyway and they would rather have a "few freight trains" roll through their property every day rather than a " bunch of damn bicyclist ".

Crime

With Phase 1 open for about seven months, there were an estimated 25,000 user days including the use of the trail within the city of Garnett. Damage reported from rural landowners along the trail during that period and associated with trail use; Vandalism 0, Trespass 0, Fires 0, Burglary 0.

Land Acquisition

The Prairie Spirit Trail is a 50 mile multi-purpose recreational trail which travels through three counties in Southeastern Kansas. It is built upon a rail banked Santa Fe rail corridor. The corridor was acquired in the 1860's by the Lawrence, Leavenworth and Galveston Railroad Company and carried rail traffic for its various owners until 1990. Approximately 43% of the corridor was deeded to the L. L. & G. rail line by Congress in 1863, the rest of the corridor was acquired through the purchase of easements and right-of-ways from landowners.

Funding

Intermodel Surface Transportation Efficiency Act monies, which come from Federal gasoline tax dollars, have been used to pay for 80 % of the initial trail construction costs.

Currently the trail is operated with funds from the state general fund. If legislation is successful in 1997 the Prairie Spirit Trail will be added as a Kansas state park and could then utilize Park Fee funds, (revenue taken in from state parks), as other state parks in Kansas do. This would simplify

administration and save money by cutting out the costly steps of handling the trail separately from the other state operated parks in Kansas.

Construction

The trail was divided into three phases for construction. Phase 1, the middle section in Anderson County, was first constructed due to strong support from the centrally located city of Garnett. The trail connects both of the cities' lakes and parks with the restored historic Santa Fe Depot and the town square. Phase 1 officially opened March 30, 1996 and is 18 miles in length.

Phase 2, 15 miles in length from Richmond to Ottawa in Franklin County, is due to open in September of 1997. Phase 3, which runs primarily in Allen county and ends in lola is 17 miles in length with a projected completion in 1999.

The trail surface is 10 feet wide and composed of 4 inches of compacted limestone screenings. Calcium chloride is added to harden the trail surface for erosion control and ease of bicycle travel. This is placed over the existing railroad ballast.

Access

The trail is handicap accessible due to the moderate grades used by the railroad and the limestone surfacing. Only maintenance, law enforcement or other special use motorized vehicles are allowed on the trail. Current trail heads are located in Garnett, Richmond and Welda. Restroom facilities are available from March -November in Richmond and Welda. Facilities are open year round in Garnett.

Current Problems and Solutions

In January, Senator Doug walker of Osawatomie who was instrumental in helping with the Prairie Spirit Trail, was replaced by Robert Tyson. Tyson opposed the trail in his campaigned and one of the major trail opponents was co-chairman of

his campaign in Anderson County.

Rep. Stanley Dreher of lola has voiced his opinion against the trail and construction of phase 3 in Allen County where he lives.

Without state-wide support the trail may have a hard time being completed, this could spell disaster for the future of trails in Kansas. Unfortunately this has been thought of as a local concern and many people throughout the state who could benefit from rail trails are unaware that the future of trails in Kansas is being decided now.

Those who would care to see these rail corridors remain Greenways and trails in Kansas need to let their representatives know that they are in favor of the Prairie Spirit Trail as a state park. Letters should also be sent to newspapers and to elected officials in the counties through which rail trails travel. They need to know that there is a need for trails and Greenways and people would use the trails if they were built.

Please Contact:

Senator Robert Tyson, Route 1, Box 229, Parker, KS 66702

Rep. Stanley Dreher, Rural Route 3, Iola, KS 66749

Rep. Bill ?, Rural Route 1, Garnett, KS 66032

To join the Friends of the Prairie Spirit Trail and receive a monthly newsletter of current trail events and show support of the trail, send $5.00 to: Friends of the Prairie Spirit Trail, P.O. Box 71, Garnett, Kansas 66032

For trail information Contact the Kansas Department of Wildlife and Parks at the Garnett Chamber of Commerce Office (913) 448-6767. — Trent McCowan

An Activity to Introduce Critical Thinking

NSTA Share the Wealth Session: Brad Williamson

Brad Williamson, Olathe East HS, Olathe, KS

Science teachers are working hard to respond to our needs for a scientifically literate citizenry. It could be just the crowd I hang around, perhaps it's just our increased ability to communicate or it could be my occupational bias but I am certain that more science teachers provide more effective laboratory experiences more often than in the past. Without addressing the limitation of standardized testing, why do we (the U.S.) fair so poorly when compared to other countries achievement in science education?

I do not wish to provide an extensive analysis here, it's neither the time nor the place but I would propose that a fundamental problem exits today that must be countered before the goal of "science for all Americans" can be attained. That problem is our society's propensity for the acceptance of the weird and supernatural as viable models of the natural world. For want of a better way of describing this problem I am referring to it as a lack of critical thinking skills. The following activity brings home to you and your students an important message--the importance of skepticism when encountering and explaining weird phenomena.

Background Information

This activity is based on an experience that I had at an NSF funded teacher enhancement project

at Benedictine College in the 1980's. Jim Teller, a teacher from Iowa, and I essentially conned the rest of the participants into believing that I had some sort of paranormal talents. Of course, I didn't have any such abilities but I was struck by how easy it was to fool almost all of the other teachers into believing that I did. I am convinced that we all received a valuable lesson from Jim, one that you can share with your students.

This type of activity is difficult to standardize so that it works everywhere. I'll simply provide a narrative of what I did with my classes this year. Hopefully, you'll have enough detail so that you can repeat the experience for your students if you wish. Also, I hope that the broad concepts of what is involved will be clear enough that you can design your own experience.

Every year, at the beginning of the school year, something in the media really disturbs me. It might be a report on "crop circles" or a discussion of Nancy Reagan's reliance of astrological consultation for scheduling former President Reagan's social calendar. This year, it was the prevalence of network shows that are based on the presumption of alien life forms here on this planet or the ability to "profile" a murder. I wait until something that reeks of paranormal or pseudoscience occurs in the media. Unfortunately, you can count on the near ubiquity of this kind of material in the media. In response, without student foreknowledge, I arrange a paranormal experience in our classroom that fits seamlessly with whatever topic that we are covering.

The gist of the experience is to set up a situation in which the students discover that one of their classmates have ESP. I've pre-selected this student as an accomplice--no one is suspicious. The discovery is by accident. Once the claim is made then a series of tests or experiments are performed. I set the parameters for the first set of tests, all the while being openly skeptical. Students have input by modifying the experiment within the parameters. The students want to believe in ESP so badly that they will usually not suspect that I and the ESP student are working together. Basically, I provide various clues to the ESP student about the solution to various experiments. The ESP student "proves" they have special abilities. This year my students were either particularly gullible or we are getting pretty good at pulling off a con since most of the classes were so convinced that they wanted exploit the ESP student for money. One of my students said to me with his mom present, "Mr. Williamson, what you did I Biology today was absolutely horrible!" His mom naturally was interested at this point. He then went on to say, "Today was the best science class he had ever had!" Hopefully, at least one student is skeptical enough to figure out that I am part of the trick but if they don't we let them in on it towards the end of the hour. After this experience I have little trouble convincing them of importance of critical thinking.

Specific details of the "con"

1. I selected a student accomplice at the beginning of each hour making sure to not draw any special attention to what I am doing. I select carefully. You need someone who can think on their feet but that no one will suspect. I tell them that today they are going to have ESP. Their interest is peaked at this point.
2. I inform the student accomplice that sometime during class discussion the topic will get around to ESP and when it does be sure to volunteer. It is important that this discussion seem to be spontaneous and unplanned. Bring the students into the discussion. Eventually what I actually do is that I ask for a show of hands for those who think that they have experienced some kind of ESP-type of event. Several, including the accomplice always volunteer.
3. The student accomplice and I quickly agree upon a set of signals before class. Since I set the parameters for the test, this is easy. I tell the accomplice that six objects will be on a table and one will be selected while he/she is out of the room. When they return they will "know" which object is selected because I'll tell them. I tell them that I'll be holding a clipboard for taking data on the experiment. They should visualize the clipboard as the table holding the six objects. Where I am holding my hand on the clipboard will indicate the location of the chosen object on the table. That's all there is to it. However, since any good con has to have a back up we also establish a set of clues in case something goes wrong. One set of clues is the manner that I call them back into the room. For instance, if I say "Ready, now" then that means that something has gone wrong. They are to feign difficulty and say that something is not right this time. Another set of backup clues is my own position around another table in the room or my position in the room. There are lots of ways of doing this once you have an accomplice. Be creative and make sure that you have signals for when things aren't quite right.

During class discussion when the students volunteer that they have suspect they have some form of ESP I suggest that we take six random

objects and place them on a table. I carefully arrange the objects on the table. The suspected ESP students leave the room. A students volunteer selects one of the objects. This is done so that all of us remaining in the classroom know which is the selected object. The students come back into the classroom. The class is asked to concentrate on the object that was selected but don't give any clues. Each of the returning students takes a guess at which object was selected. There's a one out of six chance the correct object will be selected by any one student so we have to repeat the experiment several times. I inform the class of the odds at each trial. Naturally, usually after a couple of trials only the accomplice is correctly "detecting" the object selected. At this point I let the students in the room select 2 objects at once or none. When the accomplice returns I signal tat something is changed and they can usually read any new signal that I make. It's important that when the accomplice returns to the room that you (the teacher) is talking so that the accomplice has a legitimate reason for looking in your direction.

Within a short time nearly the entire class will be convinced that this person has ESP. Hopefully there will be a few that are skeptical and will want to try other forms of tests. Ask why, use this skepticism as a starting point for experimental design. Let them find you out--if possible. If not, be sure to expose the charade with enough time to discuss the purpose. This activity is not designed to make fools or teach con games. It's purpose is to let students know how easy to accept rather outlandish claims.

To complete the lesson, the next day I show the NOVA video, "The Power of Psychics." This video features the "Amazing Randi" debunking various psychic phenomena. Try it you'll be "amazed".

The Use of Human Body Fluids and Tissue Products in Biology Teaching

The NABT Board of Directors voted on October 25, 1995, to adopt the following Position Statement on "The Use of Human Body Fluids and Tissue Products in Biology Teaching. " NABT position statements are for use by teachers in their efforts to obtain support and enrich the teaching environment. Please discuss this statement at faculty meetings and with administrators. We welcome member comments.

Laboratory activities using human body samples can be important components of biology teaching. The chance that human body samples may transmit serious diseases raises concerns about their use in biology teaching. The National Association of Biology Teachers supports the use of human body samples for teaching biology only if teachers ensure safe conditions that prevent the spread of disease. Teachers should use substitute activities or materials if they cannot guarantee the safe handling, storage, cleanup and disposal of human body samples. Teachers wishing to use human body samples should weigh the potential risks of using these materials against the educational outcomes gained. In addition, teachers should remain sensitive to students desiring not to handle certain body samples. Human body samples used in high school and college biology pedagogy include blood, cheek cells, feces, mucus, saliva, semen, and urine. All of these should be treated as biological hazards having the potential to spread communicable disease. These samples are generally used in the following acceptable capacities:

Blood. Blood is used for blood typing studies in general biology and anatomy and physiology class activities. It is also used for microscopic and physiological analysis in anatomy and physiology class activities and immunology laboratory sessions.

Cheek cells. Cheek cells are regularly used in introductory biology classes for microscopic analysis.

Feces. Feces is rarely used in biology instruction. Materials containing feces are sometimes used in microbiology and parasitology class activities.

Mucus. Cultures obtained from respiratory mucus are used in microbiology classes.

Saliva. The enzymes present in saliva are used in general biology class activities. Cells collected with saliva are used for microscopic analysis in general biology and anatomy and physiology class activities. Microbiology class activities use saliva for obtaining oral microorganisms from tooth tartar.

Semen. Samples of semen are used for microscopic analysis in general biology and anatomy and physiology activities.

Urine. Urinalysis in anatomy and physiology classes requires freshly collected urine. Some microbiology laboratory activities entail

culturing microorganisms from urine.

Recommendations

NABT offers the following recommendations for teachers wishing to conduct activities requiring the use of human body samples:

1. Use human body samples only if you know the samples are free of disease. Do not use any samples of unknown origin. It is best to avoid using student samples collected at home or off campus.

2. Human body samples should only be used if all students, teachers, and other people coming in contact with the samples are following the Universal Precautions for handling human body samples. Proper collection, storage, and disposal methods must be followed. Guidelines for handling human body samples are available from hospitals, clinical laboratories, and public health agencies. They are published in the Code of Federal Register available through government documents libraries (see reference 6).

3. Whenever possible, try to substitute comparable but safer alternatives for human body samples. Many materials available for purchase mimic the properties of blood, saliva, and urine. In addition, The American Biology Teacher and other journals provide information about do-it-yourself sample substitutes (see references 2, 7,10,11, and 12). Disease-free animal samples of blood, feces, and semen can be purchased for microscopic analysis from biological and chemical supply companies. Pure cultures of microorganisms resembling those found in human body samples can also be purchased.

Suggested Safety Precautions To Follow with Human Body Fluids and Tissue Products

Teachers wishing to use human body samples should consider the following minimum precautions before conducting laboratory activities:

Handling. Students should not be allowed to collect samples without supervision or advice of the teacher. Samples should be collected, handled, and transferred using proper safety apparel:

- Plastic or latex gloves
- Safety glasses or goggles
- A lab coat or an apron.

Students should always wash their hands after any laboratory activity using any type of human body sample.

Storage. All samples must be used and temporarily stored in labeled, leakproof containers during classroom use. Labeling should include the type of sample, the source of the sample, and the current date. Samples kept for long term storage must be kept refrigerated in clearly labeled, leakproof containers. Again, labeling should include sample type, sample source, and collection date. Samples must never be stored near food or in refrigerators and freezers being used for food storage. Refrigerators used to store human body samples must be labeled with signs that indicate the presence of biohazardous materials or human body samples.

Cleanup and Disposal. In most areas, human body samples may be disposed of in public sewers as long as the samples are free of parasites and highly contagious pathogens. Check with city or other local agencies before doing so. Samples having parasites and highly contagious pathogens must be sterilized, as described below, before disposal. Laboratory materials contaminated with human body samples must be sterilized before reuse or disposal. Reusable materials, like glassware and microscope slides, can be sterilized using an autoclave (pressurized steam heat at 121°C for 20 minutes) or by soaking in a 10% solution (10 ml of bleach added to 90 ml of tap water) of household strength bleach (household bleach is 5% hypochlorite) for 30 minutes. Bleaching should be followed by a warm soap water wash.

Contaminated lancets, needles, or broken glass must be sterilized using an autoclave or bleach treatment before disposal. They must then be discarded in a red "Sharps Container" marked biohazardous materials. Sharps containers are available from biological and medical supply companies. Lancets and needles must never be reused. Spills must be decontaminated immediately using bleach that has soaked the area for at least 10 minutes. Contaminated broken glass must be handled with cut-proof gloves or a hand broom. All work surfaces should be wiped down with the 10% bleach solution after completion of the activity.

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Early Adolescent/Late Adolescent Life Science

Tentative Licensure For Biology In Kansas

OUTCOME #1 The teacher demonstrates an indepth understanding and application of the major concepts, principles and theories related to the life sciences.

1. The teacher demonstrates an in-depth understanding of the major concepts and principles of life science including (a) structure, function and taxonomy of organisms, (b) growth, development and reproduction of organisms, (c) ecological relationships, (d) biological basis of animal behaviors and plant responses, (e) evolutionary theories, (f) genetic and molecular basis of inheritance, (9) cellular basis of life, (h) human anatomy, physiology and ecology, and (i) the role of and transformation of matter and energy in biological processes.
2. The teacher knows the natural history of flora and fauna found in the region.
3. The teacher understands the interconnectedness of the science disciplines including the unifying concepts of systems and interactions, energy and matter, patterns of change, stability, and models.
4. The teacher understands the historical development of current science theories and knowledge.
5. The teacher is able to distinguish the nature of science (i.e. science as a way of knowing) from other ways of knowing the world.
6. The teacher understands the algebra of real numbers and trigonometric relationships.

Dispositions

1. The teacher values stewardship for the environment.
2. The teacher appreciates the beauty and wonders of science.

Performance

1. The teacher recognizes the major types of regional flora and fauna.
2. The teacher relates science concepts to technological, societal and current event issues.
3. The teacher accesses resources necessary to stay current in science.
4. The teacher applies computer skills and the mathematical skills of the algebra of real numbers, trigonometric functions, and statistical analysis necessary to do investigations in the life sciences.
5. The teacher applies knowledge of physics, chemistry and earth/space to life science concepts.

OUTCOME #2 The teacher demonstrates an understanding of laboratory procedures and research skills related to the life sciences.

Knowledge

1. The teacher knows how to design and conduct inquiry-based, open-ended

laboratory and field experiences.
2. The teacher has knowledge of state and national safety regulations applicable to science both in the classroom and in the field.
3. The teacher has knowledge of basic life science laboratory skills and procedures.

Dispositions

1. The teacher appreciates the scientific approach, its power and its limitations, in understanding the natural world.
2. The teacher appreciates the values of science: regard for the truth, objectivity, open-mindedness, creativity, intellectual curiosity and responsible reporting.

Performance

1. The teacher locates appropriate resources for student scientific investigation.
2. The teacher facilitates student location of resources.
3. The teacher selects and uses appropriate, up-to-date tools for the study of life science.
4. The teacher uses and maintains equipment properly, stores and disposes of chemicals safely.
5. The teacher demonstrates ethical and appropriate use, care and culturing of living organisms

OUTCOME #3 The teacher demonstrates an understanding of teaching skills specific to the life science

Knowledge

1. The teacher can relate career opportunities to life science
2. The teacher will be familiar with the current curricular materials for life science
3. The teacher has a working knowledge of the current state and national curricular standards for science.

Dispositions

1. The teacher has enthusiasm for teaching science
2. The teacher believes all students should have the opportunity to attain a high level of scientific literacy.
3. The teacher is aware of his/her value as a resource in the community as well as the value of the community as a resource for instruction.

Performance

1. The teacher becomes involved in professional science education activities and shares knowledge and ideas with colleagues.
2. The teacher recognizes and addresses erroneous stereotypes of science and scientists
3. The teacher develops strategies to deal with students' misconceptions and guides the students to an understanding of the concepts of life science
4. The teacher uses appropriate multiple assessment techniques including performance assessment techniques and scoring rubrics consistent with local, state and national science standards.
5. The teacher utilizes techniques which allow students to construct knowledge of science concepts through use of the learning cycle (discovery, invention, application).
6. The teacher creates interdisciplinary learning experiences requiring the integration of subject matter in life science with other subjects.

Teachers get paid too much

I'm fed up with teachers and their hefty salary guides. What we need here is a little perspective. If I had my way, I'd pay them babysitting wages. That's right...instead of paying these outrageous taxes, I'd give them $3.00 an hour out of my pocket. And I'm only going to pay them for five hours, not coffee breaks. That would be $15.00 a day -each parent should pay $15.00 a day for these teachers to baby-sit their child. Even if they have more than one child, it's still a lot cheaper than private day care.

Now how many children do they teach a day -maybe twenty? That's $15.00 x 20 = $300 a day. But remember, they only work 180 days a year! I'm not going to pay them for all those vacations. $300 x 180 = **$54,000.00** (just a minute, I think my calculator needs batteries).

I know now you teachers will say, "What about those who have ten years' experience and a Masters degree?" Well, maybe (to be fair). they could get the minimum wage and instead of babysitting, they

could read the kids a story. We could round that off to about $5.00 an hour, times five hours, times 20 children. That $500 a day times 180 days. That's $90,000.00...HUH?

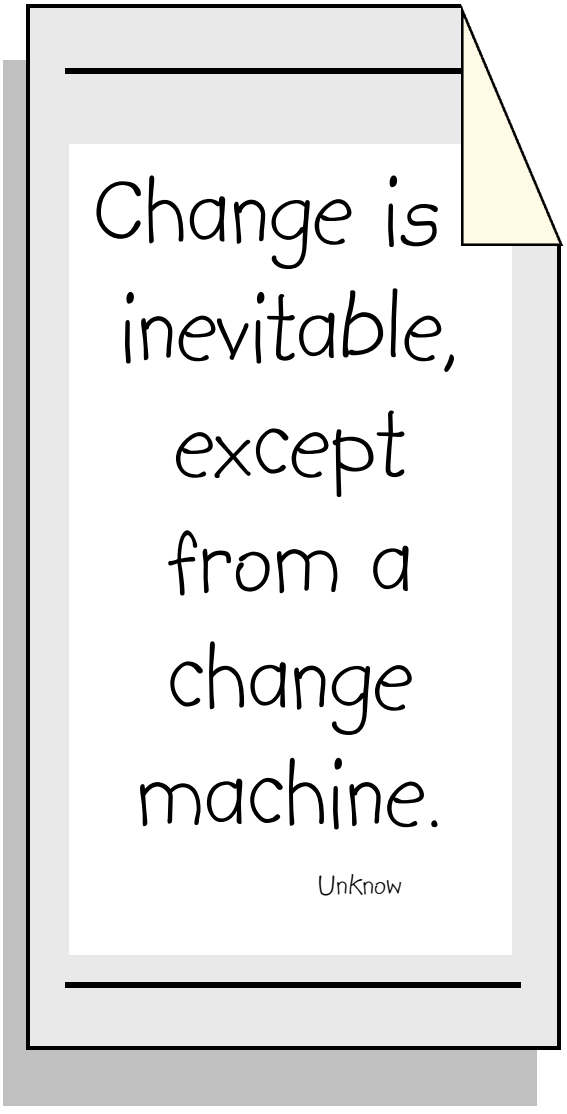
Wait a minute, let's get a little perspective here. Babysitting wages are too good for these teachers. Did anyone see a salary guide around here????

-Author Unknown

-submitted by L. D. Winton

"Common sense isn't so common."

Voltaire



Genetic Engineering

Lab Courtesy of Ernie Brown, Trego Community High School, Wakeeney, KS and other sources.

Introduction:

Many people have heard the term Recombinant DNA, but most of them probably couldn't tell you the difference between a plasmid and a platypus. Bioengineers make news using recombinant DNA techniques in hope of curing genetic diseases, better understanding cancer, and improving agricultural yields. But while promising much, such techniques have presented and will continue to present society with some very difficult moral and ethical problems.

Recombinant DNA technology can be used to produce substances in large amounts and is used to study basic biological processes. A gene coding for a particular protein is transferred into a host organism. The host organism multiples, and the increasing host population produces the desired protein in large volume. For example, the gene that codes for the production of human insulin has been inserted into the common bacterium Escherichia coli, commonly referred to as E. coli. These bacteria can then be grown in huge vats under ideal conditions producing large amounts of human insulin which can be easily harvested. Researchers have already developed sources of interferon, human growth hormone, and hepatitis B vaccine using recombinant DNA techniques.

Steps to recombination:

To begin the recombinant DNA process, scientists must first identify the gene that codes for the production of the protein they want to manufacture. After they have identified the gene, they must isolate it. Restriction enzymes, or endonucleases, from bacterial cells are the key in this step. They are isolated from bacteria that use them to destroy, by cleaving or cutting out, any foreign DNA from organisms that invade the bacterial cell. What makes restrictions enzymes so useful is that each recognizes and cleaves only a very specific sequence of DNA. These restriction enzymes make a staggered cut of the DNA yielding "sticking ends," By using enzymes that will cut the DNA on either side of the gene, the gene can be clipped out of the DNA strand.

Once scientists obtain the gene they are looking for, they must somehow get it into the host cell. This transfer step is accomplished using the plasmid, a small ring-shaped piece of DNA found naturally in most bacteria. Plasmids have a region, called the replication origin, that enables them to be replicates. Plasmids often perform other functions such as antibiotic resistance. Multiple copies of the plasmids used in recombinant DNA technology exist normally within a bacterial cell.

After removing a plasmid from a bacterial cell, scientists cleave the plasmid using the same enzyme they used to clip out the gene. This way the sticky ends of the plasmid will match those on the ends of the gene segment. Then the cleaved plasmid and the cleaved gene are mixed together. If all goes well, the sticky ends of the gene and the sticky ends of the plasmid come together, their complementary base pairs joined by hydrogen bonding. A DNA ligase enzyme is added to create a stronger bond at these new joints.

Finally, bioengineers mix the plasmids with host bacteria. To check that the plasmids have been accepted by the bacteria, they test the bacteria for an innate characteristic of the plasmid. For example, if a plasmid contains resistance to an antibiotic, scientists could spread the bacteria that hope contain these plasmids on a petri dish of agar mixed with that particular antibiotic. Only the bacteria containing plasmids with that particular antibiotic resistance and the replication origin will survive. All bacteria containing plasmids without that desired antibiotic resistance would not survive their exposure to the antibiotic. At some point, the plasmid would be tested to determine that it had not been closed without incorporating the gene. Inside the bacteria, the plasmids are replicated so that they exist in multiple copies. The gene becomes active and the bacteria begin producing the desired protein.

This lab activity will require cooperation between you and your partner. Each pair of students will submit one report. Read and follow the directions closely. Review your class notes on plasmids and recombinant DNA technology.

1) From the lab equipment table, obtain two scissors and a roll of cellophane tape.
2) Cut the plasmid strips(blue sheet) and assemble them end to end in any order. {Option: discard any two of the strips except for the strip which contains the "plasmid replication site" (See code at the bottom of the blue sheet)}. Once the pieces are joined, the two remaining ends should be taped together to give the plasmid its circular shape.
3) As one partner cuts the plasmid strips, the other partner should cut the cell DNA (gold) strips. Tape the cell DNA together in the order indicated at the bottom of each strip. That is, strip #2 is taped to the bottom of strip #1, strip #3 is taped to the bottom of strip #2, etc. Note where the DNA code for insulin (the protein

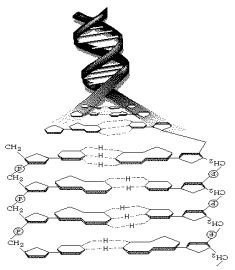
gene) is located.

4) After completing steps 2 and 3, use the plasmid ring pattern at the top of the answer sheet to map relative locations of the DNA code for each of the antibiotic resistance's. Use a pencil to mark the positions and label each of the genes for antibiotic resistance that your plasmid contains.
5) You have been provided 8 different restriction enzymes which are capable of cutting the plasmid or the cell DNA at specific sites and one ligase molecule for fusing them together again (green sheet). Note that on each of the restriction enzyme rectangles, there is the name of the enzyme (such as Ava II) and the short DNA sequence that shows exactly what sequence that enzyme cuts. Use your scissors to cut the restriction enzymes and ligase apart.
6) Select the restriction enzyme you will use to cut the plasmid and cell DNA. The enzyme you must be able to cut the plasmid once and the cell DNA at two sites, one above and one below the gene for insulin. It is important that you find an enzyme that cuts as close to the insulin gene as possible. Some of the enzymes cannot cut your plasmid; some can. If an enzyme does not meet your needs, it is not usable.
7) Select a restriction enzyme and check the blue plasmid ring for the location or locations which can be cut by this enzyme. Mark on the plasmid map the approximate location where the enzyme will cut. Label each site on the map with the name of the enzyme and note on the table how many times it cut the plasmid. Remember that the enzyme you select must cut the plasmid only once. Continue this procedure until all 8 enzymes have been tried on the plasmid and their restriction sites marked on the plasmid map.
8) Once you have selected those enzymes that cut the plasmid once, check those enzymes against the cell DNA strand. Remember that the goal is to find an enzyme that will make two cuts close to the gene for insulin, one above and one below. It is essential that the enzyme not cut into the insulin gene itself. Mark on the cell DNA strip where each enzyme will cut. Draw the line accurately where the bases will be cut apart leaving the desired "sticky ends." Write the name of the enzyme next to each line you draw, and record the information in the table on the answer sheet.
9) After you have completed testing the enzymes, select the enzyme which you will use to cut the plasmid and the cell DNA. Use your scissors to make the cut in your plasmid and the cell DNA. Be certain to make the cuts in the staggered fashion made by the actual enzyme. This will expose the "sticky ends" where joining will be possible. Since only one enzyme was used, all ends will be compatible. Use your tape to splice your insulin gene into the plasmid chain. You have now created a recombinant DNA molecule.
10) Fill in the remainder of the spaces in the table on the answer sheet. Give brief reasons why you selected the enzyme you did and why you didn't use the others. When completed, submit your completed answer sheet with your plasmid attached.

Conclusion:

In an actual lab situation, you would now mix your recombinant DNA plasmids with the bacteria of your choice. These bacteria are usually treated with a calcium salt to make them more permeable to the plasmids. These treated bacterial cells will take in the modified plasmids, which include both the original plasmid genes and the gene for insulin which has been added. When cultured on petri dishes containing medium with antibiotic added, only those bacteria which contain the plasmids with the selected antibiotic resistance can be expected to survive. Bacteria without resistance to the antibiotics kanamycin, ampicillin, or tetracycline would be killed in the culture medium. The surviving bacteria can then be cultured in large vats under ideal conditions of food, pH, and temperature.

Under ideal conditions, E. coli will reproduce every 20 minutes. Insulin produced by the bacteria can easily be harvested. After purification, it is sold commercially for treatment of diabetes.



Restriction Enzymes

C G **C G** **T A** **G C** **G C**	**Ava II**	**G C** **G C** **C G** **C G**	Hpa II	LIG	ASE
T A **C G** **T A** **A T** **G C** **A T**	Bgl II	**T A** **T A** **C G** **G C** **A T** **A T**	Hin dIII	**C G** **T A** **T A** **A T** **A T** **G C**	Eco RI
C G **T A** **C G** **G C** **A T** **G C**	Sac I	**G C** **G C** **G C** **C G** **C G** **C G**	Xma I	**C G** **C G** **T A** **A T** **G C** **G C**	Bam HI

CELL DNA (Yellow)

T	A	G	C	T	A	T	A	G	C	T	A
G	C	A	T	T	A	T	A	T	A	T	A
G	C	G	C	G	C	C	G	A	T	C	G
G	C	A	T	C	G	G	C	A	T	G	C
C	G	T	A	A	T	T	A	T	A	A	T
C	G	T	A	A	T	C	G	A	T	A	T
T	A	C	G	G	C	A	T	T	A	C	G
A	T	T	A	G	C	T	A	T	A	G	C
G	C	T	A	T	A	G	C	C	G	G	C
G	C	A	T	A	T	T	A	C	G	G	C
C	G	A	T	C	G	G	C	T	A	G	C
A	T	G	C	A	T	C	G	C	G	C	G
C	G	T	A	T	A	C	G	C	G	C	G
A	T	C	G	A	T	T	A	T	A	C	G
G	C	A	T	A	T	T	A	T	A	T	A
G	C	A	T	C	G	T	A	A	T	A	T
G	C	G	C	G	C	T	A	A	T	G	C
C	G	C	G	T	A	A	T	G	C	G	C
C	G	A	T	C	G	A	T	A	T	A	T
C	G	G	C	T	A	A	T	A	T	C	G
G	C	G	C	C	G	T	A	T	A	C	G
1		2		3		4		5		6	

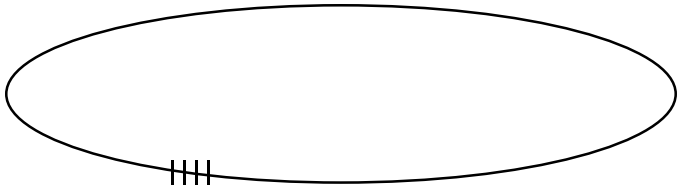
PLASMID DNA (Blue)

G	C	A	T	T	A	C	G	T	A	T	A
C	G	G	C	A	T	G	C	G	C	A	T
C	G	A	T	G	C	A	T	G	C	A	T
C	G	A	T	G	C	G	C	T	A	G	C
A	T	A	T	C	G	T	A	G	C	C	G
G	C	A	T	C	G	T	A	G	C	C	G
A	T	T	A	C	G	A	T	G	C	G	C
G	C	G	C	C	G	A	T	G	C	T	A
T	A	T	A	C	G	C	G	G	C	A	T
T	A	G	C	T	A	C	G	C	G	G	C
T	A	T	A	T	A	T	A	A	T	G	C
C	G	G	C	T	A	A	T	A	T	T	A
T	A	T	A	T	A	G	C	G	C	T	A
T	A	C	G	T	A	G	C	G	C	C	G
A	T	C	G	A	T	A	T	T	A	G	C
A	T	A	T	G	C	G	C	T	A	A	T
G	C	G	C	G	C	G	C	A	T	A	T
G	C	T	A	G	C	G	C	T	A	C	G
T	A	A	T	A	T	C	G	A	T	T	A
C	G	G	C	C	G	C	G	C	G	C	G
T	A	G	C	T	A	C	G	T	A	C	G

	ampicillin resistance		kanamycin resistance
	tetracycline resistance		plasmid replicati

Plasmid Map:

Use the map below to show the relative positions of the genes for antibiotic resistance and the approximate location(s) of the cuts



Plasmid Replication

Enzyme Name	Number Of Cuts On:		Used	Not Used	Reason For Use Or Non Use	
	Plasmid	DNA	(X)	(X)		

Answer the following questions:

1. Which of the antibiotic resistance's does your plasmid contain?

2. Why did you select the restriction enzyme you used?

3. Why was it necessary to use the same enzyme on the DNA that you used on the plasmid?

Outstanding Biology Teacher Award

Since 1961, the National Association of Biology Teachers each year attempts to identify an Outstanding Biology Teacher in all 50 states, Puerto Rico, Washington D.C. and overseas territories. The program continues strong, sponsored by Prentice Hall Company which gives each awardee a world-class pair of binoculars. Award winners also receive certificates as well as public recognition and professional gratification. Each year NABT honors recipients at a special luncheon held in conjunction with NABT 's National Convention. This is an excellent way to reward outstanding biology teachers for their valuable contributions to the profession and to their students.

WHO IS ELIBIGLE?
All biology teachers in grades 7-12 in public or private schools, who teach primarily life sciences. Membership in NABT is not required. Candidates may be renominated in subsequent years.

WHO CAN MAKE NOMINATIONS?
Colleagues, administrators, students, the teacher/candidates themselves or anyone competent to judge the candidate's teaching effectiveness.

WHAT ARE THE CRITERIA?
Teaching ability and experience, cooperativeness in the school and the community, inventiveness, initiative and inherent strengths.

WHAT IS THE PROCESS?
Candidates will complete a record form summarizing their professional experience, academic background and educational philosophy. Two recommendations from colleagues closely familiar with each candidates's teaching effectiveness are required.

HOW DO I PARTICIPATE?
Write for nomination forms from the state's OBTA director:

Barry Schartz
Science Department
Goddard High School
310 South Main
Goddard, Kansas 67052

The DEADLINE for submitting nomination materials for consideration is February 15.

Outstanding Biology Teacher Award Nomination Form

Name of Candidate:_____

Candidate's School:_____

School Address: _____

_____

School Phone: _____

Your Signature: _____

Your Title / Connection To Candidate:_____

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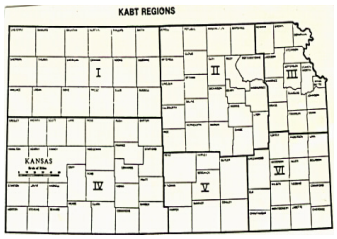

"It's not science. Science is not about control. It is about cultivating a perpetual condition of wonder in the face of something that forever grows one step richer and subtler than our latest theory about it. **It is about reverence, not mastery.** It might, from time to time, spin off an occasional miracle cure of the kind you dream about. The world we would know, the living, interlocked world, is a lot more complex than any market. The market is a poor simulation of the ecosystem; market models will never more than parody the increasingly complex web of interdependent nature."

From: "The Goldbug Variations"
Richard Powers

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John Wachholz, Treasurer

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I slept and dreamt that life was joy;

I awoke and saw that life was service;

I acted, and behold, service was joy.

Rabindranath Tagore

"Until we extend the circle of our compassion to all living things, we will not ourselves find peace."

Dr. Albert Schweitzer

"It is a monstrous abuse of the science of biology to teach it only in the laboratory----Life belongs in the fields, in the ponds, on the mountains, and by the seashore.."

James G. Needham

Change is inevitable, except from a change machine.

Unknow