

GOODNEWSLETTER



SPRING 2006

Laureen Summers, Editor

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<http://www.sesdinfo/index.htm>

LETTER FROM THE PRESIDENT

Babette Moeller

Dear SESD Friends,

As a science educator and parent of a child with disability I am following current changes in science education with excitement and also with trepidation. As required by the No Child Left Behind Act, states are currently developing academic content standards in science and are developing tests to begin assessing *all* students (including students with disabilities) in science at least once in each of the 3-5, 6-9, and 10-12 grade spans by the 2007-2008 school year.

These changes hold considerable promise for improving the education of students with disabilities. The science tests will bring about a renewed focus on the importance of science education, and add variety to the traditional indicators of academic achievement. For many students with disabilities, science is an area of strength and having test results beyond mathematics and reading will yield a more differentiated picture of a student's performance. Moreover, assessment is an important tool for educators to gauge the effectiveness of their work. Quality science assessments can help teachers to find out how well their science program is serving individual and subgroups of students. This is particularly important for students with disabilities who often need instructional approaches that are carefully tailored to their individual strengths and needs.

However, whether or not science testing will live up to its promise for students with disabilities will greatly depend on how the tests are designed and used. What will be the quality of the tests? Will they measure student understanding of rigorous science content and scientific inquiry? Will the test be designed with all students in mind? Will they allow students with disabilities to fully demonstrate their knowledge and learning? Will the tests allow and provide guidelines for appropriate accommodations for students with disabilities (e.g., availability of alternative presentation formats, extended time etc.)? How will the test results be used? Will they be communicated to teachers, parents and students? Will teachers be able to use the results to help them improve science instruction in their classrooms? Will students with disabilities be adequately prepared for taking the tests? Uncertainty about the answers to these questions makes me nervous about what the real impact on students with disabilities will be.

To insure that the new science tests will make a valuable contribution to the science education of students with (and without) disabilities, teachers and parents need to get actively involved in assessing the quality of the test and making sure that they are used in appropriate ways.

As a teacher, it is important for you to assess the quality of the science tests in your state. How well aligned are the tests with your science curriculum? What do you need to do to adequately prepare all students, including students with disabilities for the test? Does this require changes in your science program? Will these changes serve to improve your science program? If not, make your concerns about the test known to your superiors. Supplement mandated tests with your own

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assessments that will give you a fuller picture of a students' performance. Insure that all students are being tested and that students who need it will receive appropriate accommodations for the test. Take classes/workshops to help you better understand the test results and how you can improve your science program based on them. Communicate with your colleagues and parents about test results and discuss what their implications are for teaching science.

As a parent, there are a number of things you can do as well. Make sure that your child is included in the science testing. Talk to your child's IEP team to make sure that the IEP contains provisions to adequately prepare your child for the test. Make sure that your child receives appropriate accommodations for the test. Discuss your child's test results with his or her teachers and IEP team and find out how the science curriculum and program can be improved to better serve you child's needs.

We are currently at an exciting point in time where we can make an important difference for improving the education for students with disabilities. I am sure we will all have some busy years ahead!

Best wishes to all,

Babette Moeller

National Federation of the Blind Jernigan Institute Receives Grant from National Science Foundation

Funding Will Help Build Web Portal for Blind Math and Science Students

Baltimore, Maryland (October 13, 2005): With a grant awarded by the National Science Foundation, the National Federation of the Blind Jernigan Institute has begun work on developing a Web portal for blind students interested in science, technology, engineering, and mathematics. The Internet portal will help teachers of blind and low vision students, general education teachers, parents, and students to identify products and resources designed to facilitate the teaching and learning of scientific concepts; to learn about successful blind scientists, mathematicians, engineers, and technologists; and to communicate with successful blind people in these fields, as well as with other students and teachers.

Marc Maurer, president of the National Federation of the Blind, said: "Too many blind students decide not to pursue careers in science, technology, engineering, and math, not because they are not interested in these subjects or do not have the capacity to succeed in these fields, but because they do not have access to the products, resources, and techniques that they need to study and learn scientific and mathematical principles in nonvisual ways. We intend to provide a single space on the Internet where future blind scientists, engineers, and mathematicians can get what they need to succeed in their studies and to start them on their way to successful careers."

The Web portal will become a dynamic part of the NFB's broader vision of a National Center for Blind Youth in Science. The site will point the way to resources that blind students can use to help them study science and math-related fields, such as talking scientific and graphing

calculators and books with tactile representations of biological and astronomical diagrams and pictures. Teachers and parents will also be able to identify methods which will allow them to produce appropriate educational materials for blind students, and to obtain suggestions on how blind students can fully participate in laboratory work such as biology dissections and chemistry experiments. In addition to providing links to products and resources for budding blind scientists, the portal will feature message boards so that students, teachers, and parents can connect and communicate with one another to share nonvisual experiences and techniques relating to the study of science and mathematics. The Web site will also feature interviews with successful blind scientists, mathematicians, and engineers, and will allow students to receive mentoring from blind persons who are successful in scientific studies or careers.

**National Federation of the Blind Jernigan Institute's
National Center for Blind Youth in Science
Announces the 2006 Science Academy**

The National Federation of the Blind is pleased to announce the 2006 Science Academy. This year's Science Academy will present two sessions, which will be held at the National Center for the Blind in Baltimore, Maryland. Each session will select twelve students to participate based on their interest in science, skills, and academic performance.

For those interested in participating, you will find applications online at www.nfb.org/nfbji/science_academy.htm.

The deadline for applications is *March 31, 2006*.

FACILITATORS NEEDED

We are also looking for individuals who may be interested in volunteering to be a facilitator for one or both of the sessions. If you are interested, you will find the facilitator application on the above Web site with the student applications.

Circle of Life

When: July 29-August 5, 2006

Rocket On!

When: July 14-22, 2006

Please let those students with whom you are acquainted know about these exciting opportunities! Do not forget to encourage motivated blind mentors to apply to be facilitators. For more information, or if you have questions, please contact Mary Jo Thorpe at 410-659-9314, ext. 2407, or by email at mthorpe@nfb.org.

Helping Students Who Have “Dyschromacy”

John Stiles

Adapted from an article, “Colorblindness: Invisible Disability”, from the *Iowa Science Teachers Journal* (Fall 2005) Volume 32, Number 4, pp 19-22.

Anyone who teaches is likely to have at least one student in every class who has difficulty perceiving colors in the same manner as others. It is estimated that from 4-12% of the population, usually males, is born with the genetic (sex-linked, or “X” chromosomal) disorder known commonly as “color blindness” (Keller & Keller, 2001; U.S. Department of Education, 2005).

Color recognition in humans is possible due to three types of light-sensing “cones” on the eye’s retina. A certain ratio of signals from the long (“L”) wavelength cones (reddish perceiving), the middle (“M”) wavelength cones (greenish perceiving), and short (“S”) wavelength cones (bluish perceiving) allow allowing the minds of “normal sighted” people to determine the “color” of objects. It is an evolutionary accident that has caused the human population to include those who perceive color differently: One or more of their cone types have peak absorption that differs from the norm (WebExhibits, 2005).

Studies have confirmed that the appearance of color blindness resulted from a duplication of the once single red-green receptor gene in human ancestors, which then diverged in sequence about 40 million years ago. This led to separate receptors of the green and red type, common to all old world primates, including humans, but not existing in new world primates, which split from the former when the continents separated, isolating the gene pools (Howard Hughes Medical Institute, 2005).

Can colorblindness be corrected or simulated?

Until recently, there was no way for “normal-sighted” people to understand what it is like to be colorblind by simulating the disorder. There now exist simulations that approximate what dyschromatic (colorblind) people see (Vischeck, 2005). Stanford University’s “Vischeck” computer simulations allow designers of web sites, pictures, and other documents to check their work for colorblind visibility. Of course, these are only practical for those who are not colorblind: Colorblind people see more or less the same thing in both examples.

Researchers can now enhance such things as computer displays, television images, printed media, and electron microscopes, by concentrating greens or reds without significantly altering the images for normal-sighted viewers. This process is known as “Daltonizing,” named for British scientist John Dalton, who was one of the first to study colorblindness.

Daltonizing, however, does not actually “correct” images for colorblind viewers. Although the resulting image is enhanced so that the dyschromatic viewer can distinguish colors more effectively, it is still different than what the normal-sighted or colorblind persons actually see.

Issues and recommendations

One of the greatest frustrations for colorblind students (and colorblind persons in general) is the inability of “normal-sighted” people to understand the difference in perception by those with the

disorder. As a result, colorblind persons are often not given consideration, even having to bear the humiliation of color jokes from peers, as well as indifference shown by those in positions of trust, including teachers. This is in addition to the confusion exhibited when involved in activities that depend on color discrimination, of which there are so many at every level of education.

All children entering kindergarten are screened for a number of physical and cognitive attributes, but rare is the school that includes colorblindness as one of them. Known as the “Ishihara Test,” this simple and free test, available on various web sites, is a portion of which is most often seen in biology textbooks when students are learning about sex-linked characteristics. If schools would include the Ishihara as part of kindergarten and new student screening, it would be of great help when prescribing teaching strategies for colorblind students.

A great many of the topics and activities taught in school involve color: graphs, population distributions, topographical maps, coding for books, folders, or student jobs, chemical titrations and pH tests, grouping younger children for lessons (“Everyone wearing red is in this group.”), even choosing crayons in the primary grades.

On average, every group of twenty-five students (a typical class size) will have at least one student who is colorblind. Teachers can begin by being conscious of alternatives when using visual aids; using black and white, gradations of gray, or different black and white patterns can substitute for most graphic representations. If colors must be used, there are certain hues that are better perceived by colorblind students (Start, 1989). Black and white sketches may be used for general structures. When colors cannot be substituted, it is appropriate for teachers to have visual representations displayed with the color name next to it, or to use color-coding with varying shapes. That way, students who may not perceive the color in the same way as the rest of the class, can often distinguish between the colors from their perspective and refer to the “correct” color name.

While technologies may one day help students to reduce the confusion and stress accompanying their disorder, teachers can begin now to reduce barriers for their colorblind students. It may be a simple matter of one teacher making the suggestion in order to help the many colorblind students who do, and will, attend the school. Teachers can then help individual students in a number of ways:

1. Once students have been identified as dyschromatic, teachers can make modifications in their lessons that concern color without having to abandon the activity.
2. Never ask colorblind persons to “prove” their color perception (Would you ask a deaf student to prove she cannot hear? Unfortunately, it happens often to colorblind students, even by teachers.). Not only is it terribly insensitive, it only reinforces the idea that the person’s condition is for the amusement of others. However, a colorblind person may offer to talk about his disorder so that others may learn from it. If that does occur, teachers need to be aware of how such a discussion could deteriorate, and be able to anticipate and head off such possibilities.
3. Talk privately with the student, and ask how you can be of help. Surprisingly, sometimes the parents may not even be aware that their child is colorblind: Children can be very good at hiding what they perceive as an embarrassing condition.

Finally, if a teacher is colorblind, talking to students about the disorder accomplishes four things: It shows students that an adult role model has accepted and learned to accommodate a genetic

disorder; It helps teach in a practical way about genetics; It more than likely will make colorblind students feel comfortable talking about their disorder with their peers; It helps the teacher, just as much as it does the students, understand dyschromacy, and how it is nothing to hide.

Persons with colorblindness generally lead productive lives learning to deal with the frustrations and barriers that color discrimination causes, often with humor. They can even teach themselves to identify a core of once confusing colors, albeit with great concentration. Teachers can help their colorblind students get a head start and enjoy a less stressful educational experience with understanding, patience, and by educating themselves about colorblindness.

REFERENCES

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Keller, Jr. E. C., & Keller III, E.C. (2001, March). *Using disability strategies on the web*. Paper presented at the NSTA pre-conference workshop on science and disabilities, St. Louis, MO.

Start, Jay (1989). *The best colors for audio-visual materials for more effective instruction*. In: Proceedings of Selected Research Papers presented at the Annual Meeting of the Association for Educational Communications and Technology (Dallas, TX, February 1-5, 1989). ERIC document ED308842.

U.S. Department of Education (2005). *Digest of educational statistics*. Washington, DC. http://nces.ed.gov/programs/digest/d04/tables/dt04_052.asp

Vischeck (2005). Vischeck/Colorblind image correction. <http://www.vischeck.com/daltonize/>

WebExhibits (2005). WebExhibits/Causes of Color/Colorblind. <http://webexhibits.org/causesofcolor/2.html>

WEB LINKS FOR MORE INFORMATION:

Ishihara Test for Color Blindness:
www.toledo-bend.com/colorblind/Ishihara.html

Simulations:
<http://www.vischeck.com>

SCIELAB from the Wandell lab at Stanford university:
<http://white.stanford.edu/~brian/scielab/scielab.html>

Causes of color blindness:
<http://webexhibits.org/causesofcolor/2.html>

Chromosome-based historical information: Howard Hughes Medical Institute
<http://www.hhmi.org/senses/b130.html>

Live Webcast: Science Inquiry For Students With Disabilities



Educational Equity Center at AED



Academy for Educational Development

*You are invited to join a **free** live Webcast:*

SCIENCE INQUIRY FOR STUDENTS WITH DISABILITIES

Tuesday, March 14th 4-5 pm EST

Children with disabilities benefit from Science education. They gain:

- observation skills (perceptual abilities, “looking at all the pieces”)
- critical inquiry (investigation methods, “how you might explore a problem”) and
- decision-making (solution building, and risk-taking, “what solutions will you try)

Objectives:

The goal of the webcast is to help educators (general, special education or science teachers, administrators, after-school educators, parents or family members) enable students with disabilities in grades K-4 to:

- fully engage in unique Science experiments using simple modifications
- learn about a sample skill-building activity, and
- gain positive attitudes about science and themselves through role models with disabilities in science careers.

Registration:

To register, please send your name and contact information (organization, address, phone and e-mail) to Linda at lcolon@aed.org. The first 100 registrants will receive a Free CD on the *Playtime is Science Program*¹. No special equipment other than a computer with Internet access and a phone is needed. Receive a complete transcript and a Certificate of Participation. Have an opportunity to submit your questions.

Presenter:

Sami Kahn, Lower School Science Coordinator at the Collegiate School in New York City, is President of Special Science, Inc. and former President of Science Education for Students with Disabilities (SESD) affiliated with the National Science Teachers Association (NSTA).

This seminar has been made possible through funding from the National Science Foundation for the *Reaching Science and Special Education Teachers: On-line and In-person* project.

¹ Information on the *Playtime is Science Program* can be found at <http://www.edequity.org/playtime.php>

2006 Scadden Award Recipient

The Lawrence Scadden Teacher of the Year Award, which is co-sponsored by RASEM (Regional Alliance for Science, Engineering, and Mathematics for Students with Disabilities) New Mexico State University and SEDS (Science Education for Students with Disabilities), recognizes excellence in science teaching for students with disabilities.

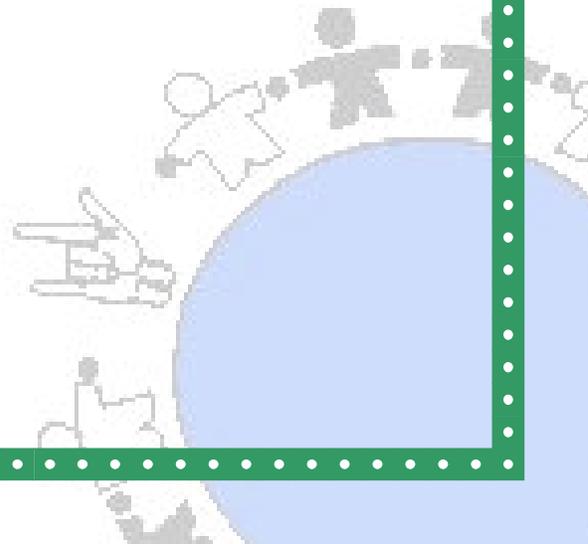
The award is open to all current K-12 teachers (general education, special education, or science teachers, public or private) who have taught at least 5 years and who have made an outstanding contribution to science students with disabilities. Each recipient is recognized at the annual National Science Teachers Association Convention and receives a \$1,000 award to be applied to travel expenses for the conference.

It gives us great pleasure to announce that Ms. Sue Ann Iannacci, science teacher at the Ridley Middle School in Ridley, PA, has been selected as the 2005-06 Lawrence Scadden Teacher of the Year Award in Science for Students with Disabilities.

Sue Ann Iannacci has been a science educator for 18 years, and has served as Teacher of Life, Earth, and Physical Science at Ridley Middle School since 1994. At Ridley, Sue Ann developed an adapted science program geared toward ensuring success in science for students with learning and emotional disabilities, and Autism. With an emphasis on real-world, hands-on, inquiry based science, "Mrs. I" (as she is known to her students) maintains the highest standards for all of her students and was the driving force behind her district's movement toward incorporating high quality science into the special needs classrooms.

Ms. Iannacci's impact has been tangible; before her adapted science program was developed, nearly 30% of the special needs students were failing science. Today, the vast majority are passing with good grades and great enthusiasm for science.

Ms. Iannacci has been identified by the state of Pennsylvania as a Keystone Technology Educator for excellence in using technology in the classroom. She also served as Science Department Chairperson at Ridley Park for seven years, has published numerous articles on best practices in science education. Ms. Iannacci holds a M.S. in Environmental Sciences and Teacher Education, an M.A. in Education, and a Certificate in Inclusion.



Exemplary Science Teaching Resources & Models

John Stiles

Consultants & Science Educators: Below is a compilation of suggested links to videos of exemplary science teaching. I hope you find them useful.

- University of Missouri links to science teaching videos, *submitted by Sandi Abell, Univ. of Missouri*
<http://www.teach-math-or-science.org/resources.htm>
- Annenberg's video workshop series "Learning Science Through Inquiry", *submitted by Peg Christensen, Keystone AEA 1, Iowa*
<http://www.learner.org/channel/workshops/inquiry>
- Ron Bonnstetter website at the University of Nebraska, *submitted by Greg Stefanich, Univ. of Northern Iowa*
Videos will be available soon.
- Exemplars standards-based assessment and instruction materials, *submitted by Carolyn Dillenburg, Green Valley AEA 14, Iowa*
<http://www.exemplars.com>
- "Minds of Our Own" video documentary on education and learning for K-12 educators and parents, *submitted by Joanne Olson, Iowa State University*
<http://www.learner.org/resources/series26.html>
- "Teaching High School Science," a video library for high school teachers, *submitted by Carolyn White, Iowa City Schools*
<http://www.learner.org/resources/series126.html>

All of these resources are wonderful, and I thank you all for sharing. If you find more, send them my way, and I will share them with everyone.

Do You Know a Science, Technology, Engineering, or Math Educator with a Disability?

Georgia Tech. researchers are conducting a survey to learn about the employment experiences and workplace accommodations used by science, technology, engineering and math (STEM) K-16 educators who have a disability. The survey is anonymous and takes about 20-30 minutes to complete. While there is no direct benefit to you for participating in this study, the goal of this research is to provide information to help people with disabilities successfully become teachers and to help educators who acquire a disability to be able to continue in their career. To participate in this research project, go to <http://www.catea.org/teachersurvey/>

Thank you in advance for your help with this project. Contact us at karen.milchus@coa.gatech.edu or call 800-726-9119 (voice/TTY) if you have questions about the survey.

SESD Events at the 2006 Annual Convention of the National Science Teacher's Association, Anaheim, CA

Anyone interested and all SESD members are encouraged to attend the following events:

SESD Business Meeting

The annual SESD business meeting will be held on Friday, April 7 from 2:00 – 4:00 pm in Room 304 of the Anaheim Marriott Hotel.

Science-Abled Breakfast

The science-abled breakfast meeting is an event that brings together teachers of disabled students, parents, science educators and scientists. At this meeting we will recognize the recipients of the *Lifetime Service Award for Outstanding Contributions in Science Education for Students with Disabilities* and the *Lawrence Scadden Teacher of the Year Awards*. The meeting also features presentations that highlight the educational experiences of scientists with disabilities and their contributions to science.



This year our featured speaker will be Paul-John To, a graduate student in computer science at California State Polytechnic University, and former ENTRY POINT! Program intern at IBM in Lenexa, Kansas.

His presentation is entitled: "*Living with Tourette Syndrome in an Educational Atmosphere*". During this talk, John-Paul To will give an overview of his journey through college, graduate school, and his experience as an IBM intern. He will highlight his struggle to succeed in spite of his life-long disability, what he has done to cope, and the individuals and organizations that gave him support.

The meeting will be held on Saturday, April 8 from 7:00 to 9:00 am. A hot breakfast will be served, and tickets will be required to attend. Tickets can be obtained in advance or at the conference through NSTA.

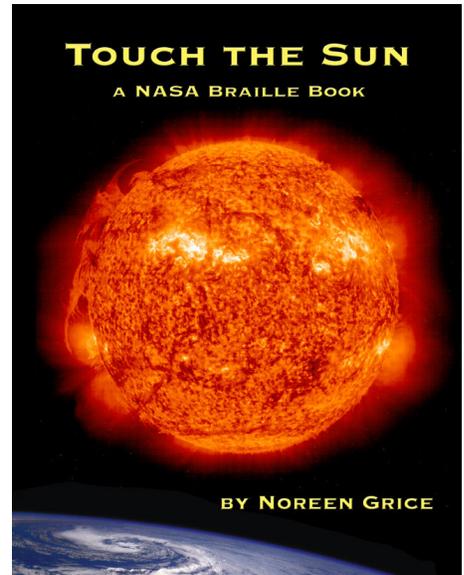
“Touch the Sun: A NASA Braille Book”

On December 2, 2005, the NFB Jernigan Institute held a launch event for an exciting new book called “Touch the Sun”, the latest book by astronomy educator Noreen Grice.

During this educational event students experienced:

- Hands-on, three-dimensional displays and science activities designed by Noreen Grice and consultants from NASA.
- A brief program and press conference after which each student received his/her own copy of “Touch the Sun.”
- An optional after-lunch tour of the International Braille and Technology Center for the Blind (IBTC).

In “Touch the Sun”, Grice innovatively pairs breathtaking color photographs with tactile renderings of the images, as well as print and Braille text to convey the dynamic nature of our closest star. As with her previous book, “Touch the Universe”, visually impaired astronomers, amateur and expert alike, will delight in the chance to explore the cosmos.



For more information, please visit <http://www.nfb.org/nfbji/tts.htm>.

Midwestern Alliance in Science, Technology, Engineering, and Mathematics (MIDWEST)

MIDWEST is a consortium of educators, scientists and disabled student service providers from the University of Wisconsin-Madison, the University of Illinois at Urbana-Champaign and the University of Northern Iowa who are collaborating to increase the quantity and quality of students with disabilities entering or completing associate, baccalaureate and graduate degrees in Science, Technology, Engineering and Mathematics (STEM), and to help students transition to employment. MIDWEST is a 3-million dollar, 5-year program that is funded by the Research in Disabilities Education program at the National Science Foundation (#0533197). MIDWEST is directed by Dr. Mark Leddy at the University of Wisconsin-Madison.

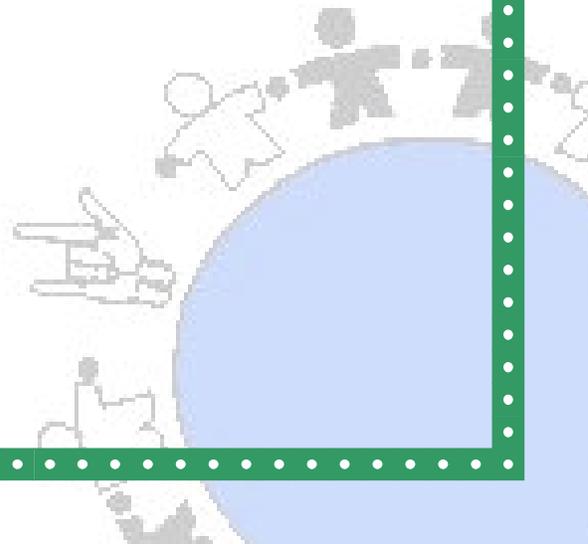
MIDWEST is identifying students with disabilities at the middle and high school, undergraduate, and graduate levels who demonstrate academic excellence and potential for success in STEM and nurturing their interests in STEM with stimulating learning activities and supportive academic success program that will advance their studies and career success. MIDWEST offers professional development activities to middle and high school teachers, to college and university faculty, and to student disability service providers so modifications can be made to curriculum, lab experiences, and internships.

MIDWEST is targeting five specific groups of students with disabilities who demonstrate potential in STEM careers, including students with visual impairments, hearing impairments, learning disabilities, mental health impairments and severe physical disabilities. Programs are

shared with students, institutions, faculty and staff, including modules that emphasize the use of current technologies to help students with specific disabilities, the use of high school-to-college and college-to-graduate school transition models, and the use of disability service models including supported education programs, individualized strategy instruction for students and disability services management structures.

MIDWEST's programs include: stipends for students and academic institutions, STEM enrichment activities, staff training regarding instruction and curricular development, improved student access and accommodations, transition programs for students between academic levels, setting and into industry, and grant writing support to faculty to gain extramural funding that supports research opportunities for students with disabilities.

For more information about MIDWEST programs, please contact:
Dr. Mark Leddy, Director and Co-Principal Investigator, MIDWEST
mhleddy@wisc.edu or 608-265-5467



Lifetime Achievement Award in Science and Disabilities

Dr. Greg P. Stefanich is the 2006 recipient of the SEDS Lifetime Achievement Award in Science and Disability. Greg, who has been a longtime colleague and supporter of SEDS, is a Regents Professor in Elementary Science Education at the University of Northern Iowa. He holds an M.S. degree in Science Education from the University of Minnesota, and a Ed.D. degree in Curriculum and Instruction from the University of Montana.

Dr. Stefanich was President of SEDS from 1991-1993. He has served on review panels for the National Science Foundation, has contributed to numerous journals, and has made presentations on his experience and expertise on promoting science curriculum for students with disabilities.

In Dr. Stefanich's own words:

"My work relating to the teaching of science to students with disabilities began in 1978 when I was invited to participate in a Working Conference on Science for Students with Disabilities that was sponsored by the National Science Foundation and the National Science Teachers Association. I was invited to be one of the speakers because of a prior history with polio as a young adolescent. The tone and substance of the sessions at the meeting, along with the sincerity of the individuals I met and interacted with, stimulated a professional commitment to contribute to improved educational opportunities for students with disabilities in science environments.



"I worked to build an academic background by enrolling in special education classes at the University of Northern Iowa and participating in a summer institute on Teaching Science to Students with Disabilities at Washington State University in Pullman, Washington by Dr. Don Orlich. Among the classes I enrolled in was an advanced practicum so I could work with students with disabilities to gain additional perspective. I have tried to maintain my commitment and have frequently taught children with disabilities and children of other cultures in conjunction with my professional activities.

"Perhaps among my most satisfying professional service activities have been the opportunity to direct approximately 10 two day pre-conference programs prior to the start of the National science Teachers Association Conferences in an effort to advance professional practice related to the Teaching of Science to Students with Disabilities.

"My personal goals this year are to increase my familiarity with best practice and effective instructional strategies for students with disabilities and to prepare a useful handbook for educators at all levels including higher education titled Inclusive Science Instruction. In addition I am hoping to develop greater awareness of assistive technologies and universal design relating to science instruction for students with disabilities. My third goal is to prepare a professional development model program that can be used in conference programs, Area Education Agencies and at the local level to inform educators about effective educational practices and opportunities for student with disabilities in the areas of Science, Technology, Engineering and Mathematics."

2005-2006 SESD Directory

Science Education for Student with Disabilities – Executive Board and Officers 2005-2006			
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