

ANNUAL REPORT 2006

FROM THE FOUNDERS

May 2007

Our Nation's economic hull has a gaping hole in it. This Nation MUST replenish its pool of citizens that are trained in science and mathematics. Failing that, the US's economic ascendancy of the last two centuries will be lost. We will descend into economic mediocrity in this 21st century. We believe that our Foundation is lighting the way to rejuvenating that economic hull and taking a big step to turn that tide.

A brief review: in the '70s, '80s, and '90s, while directing the technical e orts of Metrologic Instruments, Inc., we sensed the increasing shortage of US engineers trained in science and mathematics. We also felt that, with a carefully honed strategy, we might make a di erence. By the mid '90s, the Foundation began to take on an ambitious, if vague, outline. In 1998, Scott McVay resonated with this vision and joined our Foundation Board. Scott directed the recruitment of Dr. Angelo Collins as our Executive Director. For a year, Angelo researched the national scene of science education. In 2000, she began to outline for the Board her plan for *increasing the quality and quantity of high school science and mathematics teachers in the US through a Teaching Fellowship program.* That plan is now KSTF's course of action.

In 2002, we created our first science cohort of three teaching fellows and, in 2005, our first mathematics cohort of seven teaching fellows. In April 2007, five years later, we convened a retreat of our science sta and the three teaching fellows of the first science cohort. From that retreat, and from assessing our many other meetings, we conclude:

- 1. The Teaching Fellows' selection process is successful; we are selecting superb science teaching candidates.
- 2. We are increasing the retention of our high school science teachers significantly beyond the national norm.
- 3. Our Teaching Fellows are reaching students' hearts and minds: in the three schools in which our Fellows teach, student participation in science has increased over their tenure by at least 50%.

These observations of ours, while yet to be statistically established, are undeniable to those fortunate enough to be in the presence of our Teaching Fellows. The program sta , in addition to conducting recruiting, selection, and mentoring activities, spends considerable time and energy evaluating our programs to improve their e ectiveness.

Financially, we have become adequately funded. The endowment, plus target grants, are enough to fund our operations from investment returns. Our sta need not divert their attention to all that raising money entails. *We at KSTF are focused on our strategy*.

Still, daunting challenges lie ahead. We must 1) expand our knowledge of how to improve the teaching of science and mathematics; 2) improve and expand our own programs; and 3) interact with others, some much larger in scope than our Foundation, on how our nation can improve science and mathematics education. Our

Young Scholars Research Program and our biennial Conference Series help us address these challenges.

Our Teaching Fellows convince us that we are succeeding; we are making a significant di erence in the Nation's science and mathematics education system. We are dedicated to repairing the hole in our hull.



Janet Knowles



C. Harry Knowles

FROM THE EXECUTIVE DIRECTOR

The concern for the economic future of the United States expressed by Mr. & Mrs. Knowles, the founders of the Knowles Science Teaching Foundation (KSTF), resonates with a high-profile report released by the National Research Council in 2006. *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* begins:

The United States takes deserved pride in the vitality of its economy, which forms the foundation of our high quality of life, our national security, and our hope that our children and grandchildren will inherit ever-greater opportunities. That vitality is derived in large part from the productivity of well-trained people and the steady stream of scientific and technical innovations they produce. Without high-quality, knowledge-intensive jobs and the innovative enterprises that lead to discovery and new technology, our economy will su er and our people will face a lower standard of living.

Not surprisingly, some of the recommendations from this report focus on science and mathematics education and specifically on improving the size and ability of the teacher workforce. KSTF has anticipated the recommendations of this report with its focus on the recruitment, preparation, induction, mentoring, and retention of high-quality high school science and mathematics teachers.

The Teaching Fellowship Program brings together young men and women with exceptional knowledge of the school subjects they will teach and provides them with various forms of support. The Teaching Fellows report that one of the greatest benefits of the fellowship is being a member of a community of like-minded, supportive, challenging individuals. While each KSTF Teaching Fellowship event has its own excitement, the Summer 2006 KSTF Fellows Meeting for all fellows had a special e ervescence. The enthusiasm at this event for science, mathematics, students and their learning was palpable.

Recognizing the importance of research about teaching and teacher preparation, both to inform the Teaching Fellowship Program and the broader society, KSTF is pleased to see that the Young Scholars Program also is maturing. Drs. Olson and Rubel each are examining dierent aspects of the knowledge and skills needed for successful high school teaching. Part of the vibrancy of the Summer 2006 KSTF meeting was the opportunity for the Young Scholars to interact with the Teaching Fellows.

KSTF continues to gather survey, interview, written, observation, anecdotal, and evaluation data for internal and external current and future research and evaluation. We are especially pleased to be participating in Project SMART Induction, which stands for Science and Mathematics Research in Teacher Induction. This project is led by education researchers from WestEd and Michigan State University and carefully examines subject-specific teacher induction and mentoring.

KSTF's third program, the Conference Series, allows us to learn from and contribute to the broader education community. Our inaugural conference set a high standard for future conferences. The online conversations before the gathering promoted reflection; the venue, the Wingspread Conference Center, was conducive to deep thought and prolonged conversations; and the first drafts of the proceedings were nearing completion by the end of the year.

As the KSTF programs grow, so does the KSTF sta . Dr. Margaret (Midge) Cozzens joined KSTF in January 2006 as Associate Director. Dr. Jennifer Mossgrove arrived in July as a Mathematics Program O cer. Donna Ansell and Laraine Venuto began work as Administrative Assistants in January and June respectively. However, KSTF is diminished by the death of Mr. Boyce Adams, Trustee, friend and colleague, who died in June 2006.

Paralleling the growth of the KSTF Programs, the endowment also has grown. The potential for KSTF's programs to develop in both e ectiveness and impact is noteworthy. Everyone associated with KSTF is grateful to Mr. Scott McVay for his guidance as Trustee and his friendship. And there are not adequate words to express our gratitude to Janet and Harry for their vision and support.



ngalo Collins

Angelo Collins, Ph.D.

TEACHING FELLOWSHIP PROGRAM

The Teaching Fellowship Program is the cornerstone and heart of KSTF. The program is based on the assumption that teaching high school science and mathematics is a profession that requires complex knowledge and skills that are developed over a lifetime of practice and reflection. By selecting young people with potential to become professional teachers and by providing them with extensive opportunities for professional development, KSTF sets them on a path to success as teachers and leaders in education. Selection consists of a rigorous review of written applications, telephone interviews and a weekend of events including interviews by a team consisting of a teacher, scientist or mathematician, and science or mathematics educator. The selection process probes applicants for an exceptional understanding of the discipline they will teach; their commitment and potential ability to teach, and their leadership abilities including dedication to the KSTF values of truth and quality.

The benefits of the fellowship are intended to counterbalance some of the reasons competent and dedicated people choose to leave the profession of teaching. For example, to counterbalance the isolation and lack of support, KSTF strives to create a collegial community of like-minded teachers. Regular meetings of fellows, online discussions, funding for site-based mentors and program o cers with experience in teaching are elements of this community. To counteract the perception that teaching is a fixed career, benefits include membership in a subject-specific professional teaching association with the opportunity to attend that association's annual meetings and support for professional development during the summer.

Though KSTF has only seven cohorts of fellows who are completing their credential programs, or who are at the beginning of their teaching careers, there are some teaching fellows who are already making significant contributions to the teaching profession. For example, some, like Charles Sabatier and Melanie McWilliams in the 2005 Science Cohort, are participating in various research studies. Others, like Derek Pope in the 2005 Mathematics Cohort, have been awarded fellowships to study Japanese Lesson Study in 2007. Still others are presenting at state Science Teacher Association meetings and teacher education conferences around the country.

The highlight that follows provides a brief snapshot of just one example of a KSTF Teaching Fellow, Anne Watson, working in her school system and community to bring science learning alive for her students.

ANNE WATSON



Anne Watson, 2004 KSTF Science Teaching Fellow and physics teacher at Montpelier High School in Montpelier, Vermont, engaged her students in finding creative ways to solve energy-related problems in their school. Her students tackled the problem of finding a new way to generate electricity for their greenhouse from renewable resources. Teams of students conducted research on alternative power sources and compared their costs and benefits. Among other groups, students presented their project to the Montpelier Energy Team (MET), a group of local experts that advise city government on energy decisions. The school's administration accepted the students' proposal to install photovoltaic panels on the greenhouse. A team of students and professionals will install the photovoltaic panels in June 2007.

2006 Cohort of Mathematics Teaching Fellows:



Kathleen Brumley grew up in Denver, Colorado, and received her bachelor's degree in electrical engineering from Tulane University. Katie completed her master's degree and teaching credential through Stanford University's Teacher Education Program. She is currently teaching at East Palo Alto High School in Palo Alto, California.



Thomas Greene grew up in Denver, Colorado. He received his bachelor's degree from the University of Denver, majoring in mathematics and English, with minors in biology and leadership. He earned his master's degree in applied mathematics from the University of Washington. He is currently pursing his teaching credential at the University of Colorado at Denver.



Daniel Hahn was born in Los Angeles and grew up in Upland, California. He received his bachelor's degree in chemical engineering from the University of Pennsylvania. He then taught middle school for two years before returning to the University of Pennsylvania to earn his master's degree in education and his mathematics teaching credential. He is currently teaching at Conestoga High School in Berwyn, Pennsylvania.



Alexander Joujan was born and spent the first five years of his life in Zambia in southern Africa. He then moved to Chattanooga, Tennessee. He earned his master's degree in education and his mathematics teaching credential from the University of Pennsylvania. He is currently teaching at Freedom High School in Bethlehem, Pennsylvania.



Nicole Pack grew up in Chico, California, and received her bachelor's degree in industrial engineering from California Polytechnic State University. During her undergraduate studies, she spent one semester abroad in Thailand. She is currently pursuing her teaching credential and her master's degree at the University of Southern California.



Conswela Riddick was born in Jacksonville, North Carolina, but grew up primarily in Virginia. She received her bachelor's degree in mathematics from the University of Maryland, Baltimore County. During her time as an undergraduate, she completed summer internships with NASA. She is currently earning her teaching credential at Old Dominion University.



Jessica Rychlik grew up in Bu alo, New York, and received her bachelor's degree and her teaching credential from the State University of New York at Bu alo. She is currently teaching at Sweet Home High School in Amherst, New York.



Brian Swanagan grew up in Fayetteville, Georgia, and received his bachelor's degree in applied mathematics as well as a certificate in social psychology from the Georgia Institute of Technology. He is currently working toward his teaching credential at the University of Georgia.



James Town grew up in Sea Isle City, New Jersey. In what would have been his senior year in high school, Jim enrolled at the University of Southern California (USC). He received his bachelor's degree in electrical engineering from USC. He earned his master's degree and his teaching credential from the University of Vermont. He is currently teaching at Palo Alto Prep in Palo Alto, California.



Alison Wellings attended elementary school in Nova Scotia, middle school in Ontario, and high school in Greenville, South Carolina. She received her bachelor's degree in mathematics from the University of South Carolina. She is currently pursing her master's degree and her teaching credential from the University of South Carolina.

2006 Cohort of Science Teaching Fellows:



Caterina Caiazza grew up in Rochester, New York, and received her bachelor's degree in chemistry from Hobart and William Smith Colleges. As an undergraduate she earned research internships at NASA and General Motors. She is pursuing her master's degree and her teaching credential at Duke University.



Adam Cottrell was born in Asheville, North Carolina, and earned his bachelor's degree in physics from the University of North Carolina at Chapel Hill (UNC). He is working toward his master's degree and his teaching credential at UNC, where he also coaches the undergraduate rowing squad.



Aaron Debbink grew up in Burlington, Wisconsin, and earned his bachelor's degree in engineering physics at Taylor University. He is currently teaching physics and chemistry at Shenandoah High School in Middletown, Indiana, and pursuing his master's degree in physics and his teaching credential at Ball State University.



Kristen Fancher grew up in suburban Detroit and earned bachelor's degrees in chemistry and biology from Oakland University. After working for two years in industry as a synthetic organic chemist, she enrolled in her master's degree and credential program for high school chemistry at the University of Michigan.



Jason Gipson was born and raised in Houston, Texas, and earned bachelor's degrees in electrical engineering and Spanish from the University of Texas at Austin. During college, he interned for three summers with Texaco and Ford Motor Company. After graduation he worked as an information technology consultant for a small software development company before serving as a Peace Corps Volunteer in the Dominican Republic. Jason is pursuing his master's degree and his teaching credential at the Harvard Graduate School of Education.



Emily Jones grew up in Cincinnati, Ohio, before moving to Amherst, New Hampshire. She earned her bachelor's degree in geology from Beloit College. She is teaching ninth-grade science at the North Central Charter Essential School in Fitchburg, Massachusetts, while completing her master's degree and credential program at Plymouth State University.



Ajat Mehta grew up in New Delhi, India. He earned his bachelor's degree from St. Stephen's College in New Delhi, and also studied chemistry at Claire College of the University of Cambridge in England. He moved to the United States to pursue his doctorate in chemistry at Ohio State University (OSU). Ajat is pursuing his master's degree and his teaching credential at OSU.



Matthew Randall was born in Snohomish, Washington, and earned bachelor's degrees in physics and applied mathematics at the University of Washington (UW). Matt is working toward a master's degree and his teaching credential in physics, general science, and mathematics at the UW.



Katherine Shirey grew up in Arlington, Virginia, and earned bachelor's degrees in physics and studio art at the University of Virginia (UVA). She won an Aunspaugh Fellowship in the McIntire Department of Art at UVA. She is pursuing her master's degree in education and her teaching credential in physics at UVA.



Robert Tostado was raised in San Fernando, California, and earned his bachelor's degree in chemistry from San Diego State University (SDSU). He is pursuing his teaching credential at SDSU.



Andrew Wild grew up in Janesville, Wisconsin, and earned his bachelor's degree in chemistry at Carleton College. He took a semester o from college to volunteer as a primary school teacher in rural Nepal. After college, he was a teacher at a large private K-12 school in northern Thailand. He is enrolled in Stanford University's Teacher Education Program, where he is earning his master's degree and his teaching credential in high school chemistry.



Jully Yi grew up in Albany, California, and earned her bachelor's degree in chemistry from the University of California, Berkeley. After college, Jully worked as a business management consultant in the Bay Area before returning to Berkeley for her master's and her teaching credential in high school chemistry. In 2006, she began teaching chemistry at Castro Valley High School in Castro Valley, California.



Christy Zuidema grew up in Timonium, Maryland, and earned her bachelor's degree in physics from Gettysburg College. Christy is pursuing her master's degree and her teaching credential in high school physics at Towson University.

Teaching Fellows Meetings

The KSTF Teaching Fellows meet three times a year — summer, fall and spring :

All five science and two mathematics cohorts of KSTF Teaching Fellows met in Chicago, Illinois, in August 2006. As in years past, a primary focus of this meeting was lesson study which involves the design, teaching and redesign of a series of lessons on an important topic. In addition to lesson study work, the three days consisted of various workshops and activities to support the fellows' work on their lesson study and in their own classrooms. For

example, Dr. Carol S. Weinstein, Emerita Professor at Rutgers University, conducted a workshop on classroom management designed to support improved student understanding, based on her book *Secondary classroom management: Lessons from research and practice.* Mike Lach, Acting Chief O cer of science and mathematics for the Chicago Public Schools gave a keynote address on the challenges of beginning teachers. KSTF Young Scholars Dr. Mark Olson (2005) and Dr. Laurie Rubel (2006) provided workshops on the use of demonstrations in science classrooms and on connecting mathematics to social justice issues, respectively.

Visiting science and mathematics classrooms was a part of many of the fellows' meetings. The 2005 Mathematics Cohort met at De Paul Catholic High School in Wayne, New Jersey, in May to better understand teaching with technology, from Brother Pat Carney, a teacher there and



KSTF Advisory Committee member. Here students are provided with their own IBM Thinkpad to do and record their work and to interact with the teacher and each other.

CKSTF is knocking the old 'those who can't do, teach' adage off its pedestal; this has given me a greater sense of purpose that what I'm doing is not only valuable in my opinion, but to society at large.

> — Emilie Rinner 2003 Science Cohort



Addressing the theme of understanding science for the purpose of teaching, the 2005 Science Cohort visited Boston Latin School in Boston, Massachusetts, to see the Living by Chemistry (LBC) curriculum implemented. They also met with Jennifer Claesgens, a chemistry educator experienced in working with this curriculum. LBC encourages students to engage in investigations and in-depth discussions of core chemistry concepts. Their meeting the following fall was held in Tempe, Arizona, where they focused on the physics and chemistry modeling curriculum developed at Arizona State University. This curriculum engages students in understanding the physical world by constructing and using scientific models to describe, to explain, to predict and to control physical phenomena.



The fall meeting of the 2006 Science Cohort was held in Seattle, Washington, to study inquiry-based methods of teaching science. The fellows participated in a workshop with the Physics Education Group (PEG) at the University of Washington (UW), using their Physics by Inquiry (PBI) curriculum. PBI is a set of laboratory-based modules that guide students in introductory physics concepts through direct experimentation. Participants rely on their own observations to construct explanatory models and use these models to predict outcomes in physical systems. The 2006 fellows observed two classes at Seattle Preparatory School to see how teachers incorporate PBI into their classroom practice. In addition to this work, the 2006 fellows participated in a workshop with Dr. Mark Windschitl, an associate professor of curriculum and instruction at UW's College of Education.

KSTF wants to change education and where it is going.
Sujata Ganpule
2005 Mathematics Cohort

The theme for the 2004 Science Cohort was understanding what science students know and understand. These fellows met in Seattle, Washington, for their fall meeting where they participated in a workshop on formative assessment, led by Pam Kraus of Facet Innovations and Dr. Stamatis Vokos of Seattle Pacific University. The workshop introduced the fellows to the Diagnoser software, designed to let students test their own understanding from a lesson. The fellows worked on developing formative assessment tools for their lesson study, which will help them pay attention to and address students' facets of thinking throughout instruction. In the spring of 2006, the 2004 Science Cohort met in Anaheim, California, and worked with Dr. Kathy Comfort of WestEd on issues of standards-based assessment. This workshop gave the fellows an opportunity to reflect on their beliefs and knowledge about formative and summative standards-based assessment; to learn about and develop standards-based assessments for their lesson study; and to focus on how they know what their students know, can do, and understand, and the implications of this knowledge for practice and instruction.

In the spring, the 2002-2003 Science Cohort met in Mount Laruel, New Jersey, where they engaged in the study of a chemistry curriculum, Process Oriented Guided Inquiry Learning (POGIL), which uses a classroom and laboratory technique developed originally for college chemistry classrooms, that is now being developed and used

in high school chemistry classrooms. POGIL seeks to simultaneously teach content and key process skills, such as the ability to think analytically and work e ectively as part of a collaborative team. The 2003 science fellows met in Virginia in October, to investigate strategies and plan science curricula for di erentiating instruction for academically diverse learners. Amy Germundson, a former high school chemistry and physics teacher and a current doctoral student at the University of Virginia led the discussion.

The 2002 science teaching fellows met in Woburn, Massachusetts, with Kathy Stiles of WestEd, for their fall meeting to study stages of professional growth necessary for teaching, mentoring, and leadership.



The KSTF Teaching Fellows develop into a community of scholars of high school science and mathematics teaching — confident in their own teaching abilities, able to support each other, and ready to act as leaders in science and mathematics education.



The future of America is inherently tied to its technology and its ability to solve problems with science. We need to have a population that can answer those questions/solve those problems, and that ability depends on their education.

— Anne Watson2004 Science Cohort

CONFERENCE SERIES

The KSTF Conference Series provides an opportunity for scholars in education, experienced teachers, and KSTF Research and Teaching Fellows to meet and discuss important topics in science and mathematics education. KSTF's expectation is that each conference in the series will contribute a significant product to the fields of science and mathematics education research and practice.

Inaugural Conference — September 19-21, 2006 Essential Research on the Preparation of Secondary Science Teachers

This inaugural conference in the KSTF Conference Series was held with support from the Johnson Foundation at the Wingspread Conference Center in Racine, Wisconsin. The conference brought together individuals with a broad diversity of expertise to address four common facets of the teacher preparation continuum for secondary science teachers. Each facet was then divided into two to four working groups:

- Science Content Preparation: Biology, Chemistry, Earth Science and Physics
- Pedagogic Preparation: Methods Courses, Field Experience, Nature of Science Course, Preparing Teachers for Diverse Populations
- · Professional Development: Induction, Mentoring, Development of Professional Knowledge
- Program and Teacher Demographics: Models of Teacher Preparation, Recruitment and Retention Demographics



The goals for the conference were:

- Drawing on existing syntheses of teacher preparation research, as well as other appropriate research literature, to map out what we know, how we know it, and what assumptions we hold about these facets of the teacher preparation continuum.
- Identify crucial gaps in our knowledge and pose important questions that we as a community feel need to be answered with regard to each facet of teacher preparation, and justify why such knowledge is crucial.
- Outline specific research projects, both large- and small-scale, that will contribute to filling the knowledge gaps and answering the questions.
- Synthesize the above into a published document that will serve as a resource for the teacher preparation community, a call for proposals for KSTF funding, and an agenda for future conferences.

Participants included:

Sandra K. Abell University of Missouri-Columbia Columbia, MO

Dan Barstow TERC Boston, MA

Angela Calabrese Barton Michigan State University East Lansing, MI

Randy L. Bell University of Virginia Charlottesville, VA

Barnett Berry Center for Teaching Quality, Inc. Hillsborough, NC

Claire Bove Bancroft Middle School San Leandro, CA

Ted Britton WestEd Redwood City, CA

Bonnie Brunkhorst California State University San Bernardino San Bernadino, CA

Renee Clift University of Illinois, Urbana-Champaign Champaign, IL

Charles R. Coble The Third Mile Group Chapel Hill, NC

Angelo Collins Knowles Science Teaching Foundation Moorestown, NJ

Larry Dukerich Dobson High School Mesa, AZ

Andrew Elby University of Maryland College Park, MD

Pamela Fraser-Abder New York University New York, NY

Kathleen Fulton National Commission on Teaching and America's Future Washington, DC Nicole M. Gillespie Knowles Science Teaching Foundation Moorestown, NJ

Janet Gless University of California, Santa Cruz Santa Cruz, CA

Ilana Horn University of Washington Seattle, WA

Roberta Jaffe University of California, Santa Cruz Santa Cruz, CA

Carole M. Johnson The Johnson Foundation Racine, WI

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Norman G. Lederman Illinois Institute of Technology Chicago, IL

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Eugene McNicholas Kittatinny Regional High School Newton, NJ

Ellen P. Metzger San Jose State University San Jose, CA

Casey O'Hara Carlmont High School Belmont, CA

J. Steve Oliver University of Georgia Athens, GA

Mark Olson University of Connecticut Storrs, CT Janet Carlson Powell Biological Sciences Curriculum Study Colorado Springs, CO

Laurie H. Rubel Brooklyn College, The City University of New York New York, NY

John L. Rudolph University of Wisconsin-Madison Madison, WI

Tom Russell Queen's University Kingston, Ontario, Canada

Kate Scantlebury University of Delaware Newark, DE

Peter Shaffer University of Washington Seattle, WA

Linda Shore Exploratorium Teacher Institute San Francisco, CA

Thomas M. Smith Peabody College, Vanderbilt University Nashville, TN

Jesse Solomon Boston Teacher Residency Program Boston, MA

Vicente A. Talanquer University of Arizona Tucson, AZ

Deborah J. Trumbull Cornell University Ithaca, NY

Emily van Zee Oregon State University Corvallis, OR

Margaret Waterman Southeast Missouri State University Cape Giradeau, MO

Suzanne M. Wilson Michigan State University East Lansing, MI

Mark Windschitl University of Washington Seattle, WA 13

YOUNG SCHOLARS RESEARCH FELLOWSHIP

KSTF awarded the first Young Scholars Research Fellowship in 2005. These two-year fellowships provide financial and professional support to recent, pre-tenure Ph.D.s in research and academic positions engaged in critical research relevant to the recruitment, preparation, induction, mentoring and retention of science and mathematics teachers in United States high schools. These fellowships support scholars from a variety of disciplinary backgrounds whose work contributes to science and mathematics educational research, practice, and policy. In 2006, the fellowship awards were \$110,000 each, plus participation in the KSTF Conference, the summer meeting and two additional meetings.

2006 Young Scholar



Laurie Rubel

Centering the Teaching of Mathematics on Urban Youth Assistant Professor of Education Brooklyn College of the City University of New York

Dr. Rubel's research is focused on the mathematics education of urban students. To enable all students to have equitable access to success in mathematics, scholars have proposed that instruction should include aspects of the students' lives using relevant urban themes that can be analyzed with a mathematical lens. Her study seeks to answer three important questions: 1) How can mathematics teachers learn to teach mathematics using relevant urban themes? 2) What are the complexities of teacher learning when students come from a variety of cultural and/or linguistic backgrounds, all of which may di er from the teacher's own background? 3) How does a structure of a professional community of learners contribute to teacher learning? In the summer of 2006, Dr. Rubel conducted a workshop for New York City high school mathematics teachers on ways to capture their urban experience and use it to design instruction. During the 2006-07 academic year, these teachers met regularly with Dr. Rubel to share results and insights.

2005 Young Scholar



Mark R. Olson

Knowing and Teaching School Science Assistant Professor of Education Neag School of Education University of Connecticut

In order to inform our understanding of the subject matter knowledge necessary to teach science for and with understanding, Dr. Olson's project consists of three concurrent and interacting lines of inquiry. The first is a qualitative inquiry into the instructional representations of subject matter used by a sample of exemplary and novice physical science teachers. The second line of inquiry develops and refines open-ended assessment items that investigate the subject matter knowledge for teaching topics in physical science. The third line of inquiry involves the articulation of the relationship between instructional representations and science subject matter knowledge for teaching. During 2006, Dr. Olson conducted pilot tests of drafts of secondary science teacher assessment items and conducted clinical interviews of teachers about their knowledge and use of representations.

KSTF THINGS TO COME

Mathematics Conference

The Knowles Science Teaching Foundation Mathematics Conference will be held in May 2008. The focus is on teachers and teaching mathematics at the high school level with two major goals: (1) to develop an overview of what is currently known about critical issues in high school mathematics teaching, and (2) develop an agenda of high priority questions for researchers to address in the next ten years. A sustainable agenda for high school mathematics education research in the coming years will be solidified by the completion of this conference.

Alumni

In 2007, KSTF will begin a new phase in its work to support beginning teachers by initiating an Alumni Program for teaching fellows. The science teachers who will become alumni on June 1, 2007 are Jennifer Barchie, Ben Buehler and Lisa Sitek. Without question, alumni will be encouraged to continue involvement in the KSTF community through the electronic discussion board. Also, alumni will begin to assume responsibilities such as mentoring at fellows meetings or at local school sites; participating in recruiting, selection and orientation events; and contributing to research activities and conferences. When there are su cient alumni, KSTF will begin reunion conferences.

Introducing Biology

While many remember high school biology as an experience in memorizing phyla and dissecting frogs, the science of biology currently requires modeling and systems approaches that rely on mathematics, physics and chemistry. This new biology is recognized by several names, including mathematical biology, systems biology, modeling biology and bioinformatics. With the focus on recruiting prospective biology teachers with expertise in and commitment to this new high school biology that matches the rigor of the discipline of contemporary practice and to a revolution that requires its implementation in high schools, KSTF plans to introduce, on an experimental basis, a biology teaching fellowship cohort in 2008. During the five years of their fellowship, these teaching fellows will help us evaluate and refine the Biology Teaching Fellowship Program.

Building at 1000 North Church St.

In the 2004 Annual Report, KSTF was described as a rapidly growing organization; in 2006 we highlighted our move into the new building on the property at 1000 N. Church Street in Moorestown, New Jersey; in 2007 we began an addition to the building. KSTF is still rapidly growing.



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Margaret Cozzens, Ph.D. Associate Director



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JANET H. & C. HARRY KNOWLES FOUNDATION, INC.

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Revenue			
Contributions			\$ 48,748,207
Gain on investments			3,826,249
Dividend and interest income			 303,709
Total revenue			\$ 52,875,165
Functional Expenses	2004	2005	
Program services	951,257	1,346,641	
Teaching Fellowships			1,699,307
Research			245,994
Conference			116,939
Supporting services	54,270	110,759	291,100
Trustees' expenses	6,000	2,054	 12,260
Total functional expenses	962,677	1,459,454	2,365,600
Change in unrestricted net assets			50,509,565
Net unrestricted assets as of the beginning of year			 30,456,020
Net unrestricted assets as of the end of the year			\$ 80,965,585
Statement of Assets, Liabilities and Net Assets - Modified	ed Cash Basis De	cember 31, 2006	
Assets			
Current assets			
Cash and cash equivalents			\$ 79,994,871
Total current assets			\$ 79,994,871
Property and equipment			
Leasehold improvements			477,842
Equipment			50,083
Furniture and fixtures			77,662
			 605,587
Less: Accumulated depreciation and amortization			57,098
Net property and equipment			 548,489
Other assets			422,535
Total assets			\$ 80,965,895
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Liabilities and net assets			
Payroll taxes payable			\$ 310
Unrestricted net assets			80,965,585
			 , ,
Total liabilities and unrestricted net assets			\$ 80,965,895

Statement of Revenue and Expenses January 1, 2006-December 31, 2006 - Modified Cash Basis

Prepared by Gold, Meltzer, Plasky & Wise | Certified Public Accountants



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