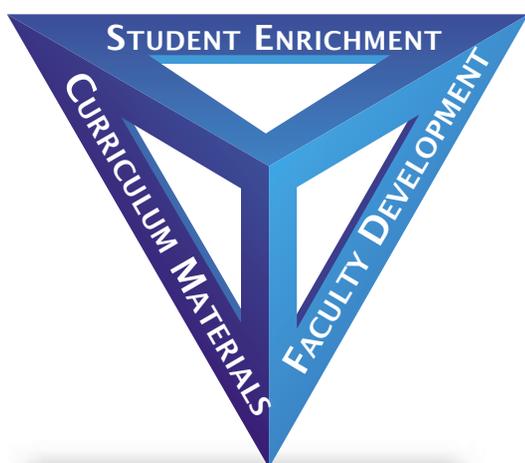


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**The Newsletter of the Shodor Education Foundation, Inc.**



## Shodor Ramps Up for a Terrific Summer

By Ismael Torres, Computational Science Intern

It's that time of the year again! Summer is always the most exciting season at Shodor, and this year looks to be one of the best yet. There will be more students, apprentices, interns, and staff here than ever before, doing workshops and exciting projects. The common denominator of all the activities this summer is the wonderment of computational science empowered by interactive computing tools: our students will realize the excitement of discovery, the power of inquiry, and the joy of learning.

The staple of our summer is a set of SUCCEED workshops on science, math, and interactive computing. Eleven workshops run over the course of nine weeks at our training facility in Downtown Durham (see the workshop schedule inside this



issue or visit [www.shodor.org/summer](http://www.shodor.org/summer)). These workshops give students an opportunity to learn how scientists use computers to create models and analyze data. Included in the SUCCEED workshops is the "Shodor Scholars Program," a two-week, full-day program that focuses on applying computational science to real world problems.

In addition, those who have taken our workshops, but who do not yet have intern-level skills, will be participating in the SUCCEED Apprenticeship Program. In this program, students

earn a stipend by working at Shodor in a learning mode while gaining experience in computational science and other related information technologies. By



the end of the program, their skills will make them competitive for a job at Shodor or elsewhere.

Finally, there will be many new and returning Shodor interns this summer. These interns are high school and college students with expertise in computational science and technology who would like to further develop their skills. Through their internships, they get a chance to develop curriculum materials and teach alongside Shodor staff. This year, a special focus will be an increased number of OPWs, that is, Other People's Workshops, where Shodor staff and interns will be helping other organizations in Durham, across North Carolina, and throughout the U.S. with their summer programs for kids.

During a Shodor summer, everyone gets his or her chance to be a teacher and a learner. Interns teach workshops and develop curriculum materials, getting feedback from workshop students and apprentices. Students mentor one another. Staff members learn what methods and materials work in Durham and add them to Shodor's online materials collection and workshops around the country. It is almost impossible to not learn about a variety of different things while you are here. It will be a fun and amazing summer here at Shodor, and we hope that you can be a part of it!

### LOOK INSIDE:

- Great Developments
- Where Are They Now?
- Apprentices Speak Up
- The Calandra Experience
- SUCCEED Workshop Schedule
- Forging Partnerships
- New CSERD Site
- Activities for Kids



## Great Developments

By Ismael Torres, Computational Science Intern

### Fuller Elementary Science Enrichment Day-

On April 28th, Kari Wouk, Monte Evans, Calandra McNeill, and Ismael Torres taught four workshop sessions on probability to 4th grade students at Fuller Elementary in Raleigh, NC as part of their "Science Enrichment Day."

**NCTM Illuminations Applets-** Shodor developed and shipped five new applets to be exhibited on the National Council of Teachers of Mathematics Illuminations website.

**Sloan Award for Excellence in the Workplace-** Shodor received the Alfred P. Sloan Award for Business Excellence in Workplace Flexibility on April 4th at the Downtown Durham Marriott. This award recognizes and honors employers that successfully use flexibility to meet business and employee goals.

**Rogers-Herr Computational Chemistry Workshop-** Robert Gotwals taught a workshop on computational chemistry to an 8th grade geometry class from Rogers-Herr Middle School on April 11th. The workshop made use of Shodor's Computational Chemistry Server, a research-level computer that can be used, free of charge, by high school students and teachers in North Carolina.

**University of North Carolina SPIRE-** On April 7th and 8th Robert Panoff, Monte Evans, and Donovan Gromet taught a 2-day workshop to post-doctoral students that gave them an overview of computational science through the use of modeling tools.

**North Carolina Central University Computational Lab Workshop Training-** Shodor staff have been training students at NCCU as part of the CI-TEAM project. These students will teach workshops on interactive computing at community centers in Downtown Durham this summer.

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*Interactions is a regular publication of the Shodor Education Foundation, Inc. To be added (or removed) from our mailing list call (919) 530-1911 or email [moreinfo@shodor.org](mailto:moreinfo@shodor.org)*

## Julie Beier: A Hands-On Mathematician

By Robert Gotwals,  
Senior Computational Science Educator

Julie Beier is a hands-on mathematician, literally. As an undergraduate at Barton College in Wilson, NC, Julie completed a double major: one major in mathematics and mathematics education, and the other in American Sign Language (ASL) and education of the deaf. This combination led Shodor to hire Julie as a curriculum developer for Shodor's first National Science Foundation grant to develop ASL-based teaching materials for deaf students and their teachers. Along with two other Barton undergrads, Julie worked directly with Shodor staff on the SUCCEED-Hearing Impaired (SUCCEED-HI) project. Her work focused both on creating new materials and on adapting existing ones, such as Project Interactivate, to make them accessible in a bilingual (ASL and English) format. SUCCEED-HI and Julie's materials now continue under new NSF funding as part of the "DEAF-STEM" project. Julie graduated from Barton, completed a Masters in mathematics last year,

and is now a full-time doctoral student in mathematics at NCSU. She has used her experiences in curriculum development at Shodor to land a part-time position at The Science House, where she works to develop materials in mathematics and chemistry.

Julie offers some interesting observations and advice for current and future interns:

"Working at Shodor was always challenging but very rewarding. You are constantly learning when you work there. There is no stand-alone field or project; collaboration becomes key.

"The skills I developed at Shodor, including teamwork, education, and technology skills, have been invaluable. These skills have proven to be useful not only in my current job, but in my academic and social life as well. I have been afforded many opportunities that stem out of my work for Shodor.

"Advice for current / new Shodorites: Learn as much as you



can and take advantage of every opportunity provided at Shodor. These skills and experiences will be useful in the future in ways you cannot predict. Another piece of advice: If you complete your work with zeal and dedication, your work will speak for itself. You should be proud of the work you complete; it is invaluable."

## Apprentices Speak Up about the SUCCEED Apprenticeship Program

By Lateasha Shirer, Computational Science Intern and Apprentice

2006 has been a good year so far! Many apprentices expressed during their interviews with me that it is a pleasure and a great opportunity to participate in the SUCCEED Apprenticeship Program. I asked Liliana Marquez, an 11th-grader from Middle College High School how she liked working here. She replied, "I like what we're doing, the challenges and

learning about science and math." Others responded expressing their happiness with the environment and the great staff. Sandy Brady, a 9th-grader from Emerson Waldorf High School said he enjoys talking to the staff here. I questioned many apprentices and they all commented on the helpfulness of the staff.

Apprentices are committing different amounts of time to the program. On average, apprentices have completed at least two or three challenges. Some are much further. Ryan Stephens, an 11th-grader of Kingsway Academy, has completed eight of the eleven challenges that comprise Level One. Once the Level One is completed, students will receive their first stipend check. Many apprentices have said, including Angela Tankard, a 12th-grader from Middle College High School, how they like that the time they commit to the program is not mandatory and that they can work at their own pace.

The SUCCEED Apprenticeship Program has opened many doors for high school students in 2006. It is truly a great opportunity to be here!



Staff member Monte Evans mentors apprentice Ryan Stephens as he learns PERL programming.

# The Calandra Experience

By Calandra McNeill, Computational Science Intern

I would like to start off by introducing myself. My name is Calandra McNeill. I am just your average person trying to make a better living for my family. Presently, I am an intern for the Shodor Education Foundation, a full time student, and a mother of two.

I have quite a hectic schedule and I must admit that I am handling it pretty well!

I was at a point in my life when I needed to make a life-changing decision concerning my future. Deep down I knew that I held a passion for web design and that I wanted more than just another job. I wanted a career, so I decided to pursue my passion and go back to school.

I began working towards a degree in Web Design at ECPI College of Technology in Raleigh, NC. I inquired about employment opportunities and was informed about an internship at Shodor. I saw this as a great chance for me to gain practical, as well as theoretical, experience.

I started by doing quality assurance testing on Interactivate, Shodor's free mathematics software, ensuring that applets for the web actually did what they were intended to do. Shortly after, I began evaluating at PERL programming tutorial

that was created by Shodor employees. At Shodor, the learning possibilities are endless, so I started taking full advantage of the opportunities.

Ironically, after I completed my tutorial, I began taking a programming logic class that utilized PERL. I was eager to see if I actually retained any information from my tutorial. After a couple of classes had progressed, the teacher recognized that I was "catching on" really well. He also noticed that I spent time tutoring and helping other students in class. It felt really good to see how I could take something that I learned and actually apply it elsewhere.

Other great things that I have done in my time at Shodor include mentoring other interns and apprentices and assisting in various workshops held for elementary and middle school students. Future plans at Shodor include leading workshops, building lessons and plans for teachers, and helping out at various triangle schools. I can't wait...

It is important to seek an internship in your specific field while starting a new career path. Learning how to ask and receive genuine help has helped me accomplish great things at Shodor.



## SUCCEED Summer 2006 Calendar:

Event	Dates	Times	Grade Levels	Workshop Fee*
Shodor Scholars Program, Session A	June 12-23	9am-4pm	Rising 8-11	\$700
Modeling Your World, Session A	June 26-30	9am-Noon	Rising 6-8	\$175
Forensics, Session A	June 26-30	1pm-4pm	Rising 6-8	\$175
Biomedical Sciences	July 10-14	9am-4pm	Rising 8-11	\$350
Forensics, Session B	July 17-21	9am-Noon	Rising 6-8	\$175
Modeling Your World, Session B	July 17-21	1pm-4pm	Rising 6-8	\$175
Math Explorations, Session A	July 24-28	9am-Noon	Rising 6-8	\$175
Environmental Science	July 24-28	1pm-4pm	Rising 6-8	\$175
Engineers in Training	July 31 - August 4	9am-Noon	Rising 6-8	\$175
Math Explorations, Session B	July 31 - August 4	1pm-4pm	Rising 6-8	\$175
Shodor Scholars Program, Session B	August 7-18	9am-4pm	Rising 8-11	\$700

\*Need-based financial assistance is available: no qualified student will be turned away for financial reasons.

For more information on SUCCEED Workshops, visit [www.shodor.org/summer](http://www.shodor.org/summer)

### Congratulations to Linda Treilman,

the winner of our iPod contest. Linda was randomly selected from our users who took the time to provide their feedback on the upcoming Interactivate 2.0 website. Linda has been teaching mathematics since the 1960's and currently teaches at The Pennington School in New Jersey. Linda enjoys the integration of technology with her teaching and was named a SMART™ Exemplary Educator in 2004. According to Linda, "each year as the technology grows, I grow with it and find new and interesting ways to present material and hard-to-teach concepts. My students still feel math is difficult but certainly see the amazing creativity that has gone into the work they are studying."

## CI-TEAM Forges Partnership Between Shodor and NC Central University

By André Clark, Computational Science Intern

Students at North Carolina Central University have recently been introduced to a new world that they may never have experienced before: the world of Computational Science. As a NCCU student I can personally attest that I had never heard of computational science until I met the Bobs (Bob Panoff and Bob Gotwals) after accepting an internship at Shodor in November of 2005. Starting in late February, NCCU, in conjunction with Shodor, began to hold Saturday workshops to introduce students to the area of computational science and to train them for the possibility of becoming interns at Shodor for the summer. The students have learned not only about computational science, but also about its uses and associated applications. In the very first meeting, which was more of an introduction to the subject, students saw how it could be used to show trends in epidemiology. Using graphs associated with some major diseases gave the students some insight on what was happening.

One of the students who attended all of the workshops was Tyrus Potts. I asked him whether or not he thought that these workshops actually helped him. I also asked him if he thought that the technologies being taught to him would be effective in his local community. He stated "I feel that these workshops would be very helpful to the kids in the middle and high school in my local community. I have never, ever heard of computational science and I assume that these younger children have not either. To these kids that feel technology is a great field to have a



career in, and to those kids that might need help in how they would approach problems that come up in school, this is a great program and I'm glad to be a part of it and, hopefully, I can do more with it in the future."

Another student by the name of Audrey Truesdale had a similar outlook on the workshops, but he also felt that, "If we are able to learn these subjects, we may be able to teach the younger students at an early age so that they will gain an interest in it, which may in turn help them either stay in school or attend a better school once they graduate high school." Finally, a student by the name of Gary Johnson, who had not attended the meetings but heard about it from his fellow classmates, stated that, "I was most intrigued by the fact that some of the people who attended Shodor when they were younger, turned around and became interns and some even come back after graduating college and worked for Shodor. I don't know of too many places that offer such experiences. They must be doing a good job over there."

## New Computational Science Education Reference Desk Site Launched

By Michael Hall, Computational Science Intern

On May 10th, 2006, Shodor released the updated version of its Computational Science Education Reference Desk (or CSERD), a pathways project of the National Science Digital Library (NSDL) that is funded by the National Science Foundation. If you have visited the CSERD site before, you will probably notice immediately that there are some very useful new search and browse features. These new features will help you to navigate through the CSERD site more quickly and accurately. We have also added an updated version of our Verification, Validation and Accreditation (VV&A) quality assurance tools to the site.

The VV&A tools allow teachers and scientists to review the activities and lesson plans cataloged in CSERD to ensure they are scientifically accurate, appropriate for their target educational audience, and usable on all browsers and platforms. **The VV&A review process will provide CSERD users—teachers and students accessing the website—with a list of tested, trustworthy learning materials on computational science from across the Internet.**

The next release of CSERD will roll out more tools that are currently under development. One important new feature for teachers will be a careful alignment of CSERD items to state and national teaching standards. The next site will let users combine searches on particular standards with searches on topic, subject, and grade level.

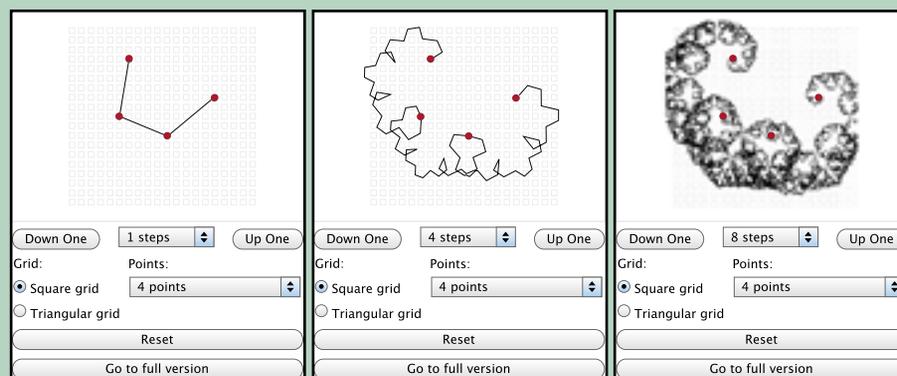
If you are interested in being a CSERD editor or reviewer please visit <http://www.shodor.org/refdesk>.

## Activities for Kids

By Ronnie Johnson,  
Computational Science Intern

Fractals are interesting and oftentimes beautiful structures that arise from relatively simple recursive mathematical operations. A fractal begins as a simple geometric shape. Once the simple shape has been specified, one can take the original shape and continually "step" through it, turning each of the shape's line segments into a scaled copy of the original shape. The more one repeats this process the more complex the shape becomes and subsequently looks quite different from the original.

The Flake Maker activity allows you to explore the nature of fractals in an intimate and hands-on way. You can click-and-drag various dots comprising a line segment in order to make the "parent" or original shape. After creating this shape you then "step" through the various stages of creating the fractal. Flake Maker also has the ability to step backwards, which allows you to analyze what happens during each step of the fractal creation process and also gives an opportunity



to compare before and after results of implementing this recursive process. The pictures shown here demonstrate this process, showing the parent shape at stage one, then incrementing to stage 4, and then displaying an image of the 8th stage.

Flake Maker is a great tool allowing you to explore the world of fractals and understand the process behind their creation while at the same time develop an appreciation for the beauty of this mathematical, recursive process. Make your own fractal at <http://www.shodor.org/interactivate/activities/snowflake/index.html>