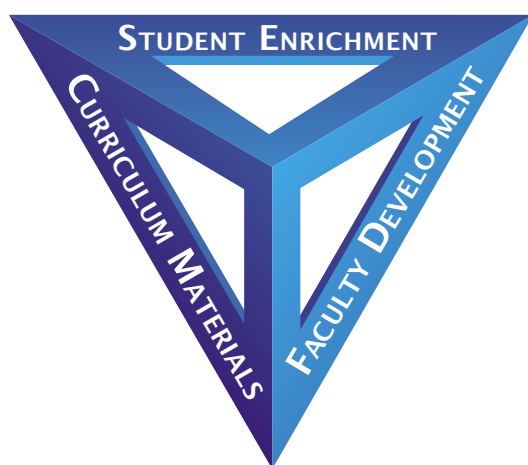




The Newsletter of the Shodor Education Foundation, Inc.



Saturday CybAdventures Bring Science Alive

By Calandra McNeill, Computational Science Intern

As part of Shodor's **Pathways to CyberInfrastructure** project, funded by the **National Science Foundation (NSF)**, Shodor and North Carolina Central University (NCCU) partnered up this fall to bring science alive to local area middle and high school students through a series of **Saturday CybAdventures** held at NCCU. CybAdventures were mornings of **hands-on experiments** and computational activities that were both entertaining and informative. Students were introduced to **web-based activities** to assist them in learning about CyberInfrastructure (connecting data, computers, and people through technology) and how to apply computational resources to the learning process.

Dr. Jim Ellenson and **Dr. Shawn Sendlinger** involved participants in fun, hands-on chemistry during the **Chem-Mysteries Adventure**. One chemistry activity the students performed was the "leaky faucet" experiment using dry ice. Students submerged dry ice into water, causing bubbles of carbon dioxide gas to form. When the gas was passed through a pipe containing a mixture of common dish detergent, it formed large soap bubbles.

The 20 students from Shodor's **SUCCEED Apprenticeship Program** and **Summer 2006 SUCCEED Workshops** who attended Chem-Mysteries were also excited to attend **Dr. Garrett Love's Cyber-Storm Adventures**. The Cyber-Storm Adventure involved fun hands-on experiments to predict the paths of hurricanes and how to anticipate when hurricanes will be formed. The students performed experiments to determine over how large of an area they would need to issue "hurricane warnings."



The success of the CybAdventures was summed up by Larry Revelle, a parent of an apprentice in our SUCCEED Apprenticeship program. He stated that his son, Alex, was excited about the event, and that "when a teenager comes home really, really excited about science, the program like this is really, really helpful." In an effort to continue this success, Shodor and NCCU have planned two CybAdventures to be held in the spring as part of Shodor's **Saturday Explorations in Science and Mathematics** workshop series. These workshops are intended for students in grades 6 through 8 (or the home school equivalent). For additional information, visit www.shodor.org/succeed/calendar.

LOOK INSIDE:

Great Developments

Shodor Brings Graphics and Web Design to After School Program

Staff Profile: Jeff Krause

Redesigned Apprenticeship Program Gathers Speed

SUCCEED Spring/Summer 2007 Calendar

WD Hill Community Center Takes CyberInfrastructure Hands-On!

Online Math Activities For Kids



Great Developments

Welcome to New Staff:

Shodor welcomes **Valerie Gartland** and **Deborah Hussey**. Valerie graduated in May from **Western Carolina University** with a degree in Computer Science and a minor in Art. She now works on our *Interactivate* website and teaches workshops. Deborah worked as an intern at Shodor this past summer, helping with Java programming and teaching summer workshops. She has since graduated from the **State University of New York at Brockport** with degrees in **Mathematics** and **Computational Science** and now works at Shodor on *Interactivate* and as an apprentice mentor.

Interactivate Featured On Air:

On December 4th, Shodor's website received around 38,000 extra visitors (or an 80% increase over normal traffic) after Kim Komando featured our *Interactivate* website on her national radio show. You can see Kim's review of our site at <http://www.komando.com/cool/sites/index.aspx?id=2617>.

Shodor Staff Present Webinar to National Science Teachers:

Shodor staff members Bethany Hudnutt and Patricia Jacobs presented a webinar, "Learning by Doing: Computational Science," via the National Science Teachers Association website in partnership with the National Science Digital Library. Teachers of grades 2-12 from around the country tuned in for the presentation, which is archived on the nsta.org website.

Shodor Staff

President & Director Robert M. Panoff, PhD	Graphics and Web Designer Jonathan Stuart-Moore
Project Interactivate Manager Bethany Hudnutt	Program Coordinator Kari Wouk
CSERD Project Manager Patricia Jacobs, MS	System Administrator Simon Karpen
Computational Science Educator Kent Robertson	Financial Support Joyce South Beth Flora
Staff Scientist Linda Schmalbeck, PhD	International Staff Cornelia Seiffert, MS Diana Tanase, MS
Computational Scientist Matt DesVoigne, MS	Educational Consultant Ron Broadnax
Computational Scientist Monte Evans	Web Developer Ismael Torres
Computational Scientist Deborah Hussey	Computational Biology Educator Jeff Krause, Ph.D.
Computational Scientist Valerie Gartland	

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

Shodor Brings Graphics and Web Design to After-School Program

By Jonathan Stuart-Moore,
Shodor Staff

After a successful summer of helping other organizations incorporate math, science, and computer experiences into their summer programs, Shodor has begun, this semester, to assist in teaching after-school programs during the school year. In addition to providing the computer enrichment component of the W.D. Hill Center's after-school program (see related article), Shodor has been leading a yearlong, after-school graphics, print, and web design class at **Training for Success (TFS)**, another Durham nonprofit. This past fall, for an hour and a half in the afternoon, four days a week, ten students in middle and high school worked to learn advanced graphics programs and to create web sites from scratch.

During the first week of classes, Shodor staff member **Ismael Torres** and I introduced students to HTML, the language used to write web sites. The group quickly progressed into learning **Cascading Style Sheets**, another language that describes colors, fonts, and layout for the web. Once students had practiced creating some of their own web pages, Shodor intern **Ben Philbrick** introduced them to **Inkscape**, a computer illustration program. Students learned how to create designs and logos from scratch. They also practiced turning real photos into stylized illustrations using a computerized tracing process. The group came up with an impressive array of imaginative and elegant logos.

With these designs complete, students turned to

creating business cards and designing graphics for their websites, reflecting the themes of their logos. Students worked with **Gimpshop**, another graphics program, to turn their digital drawings into image files that could be included in web pages. In the last week, the group raced to finish all these materials in time for an outstanding set of final presentations.

Shodor's partnership with TFS will continue until May. During the spring, students will learn more about creating web sites. Additionally, they will learn about print graphics and other media, and about other types of computer graphics, such as 3-D graphics. All of us who teach at TFS look forward to another semester of enjoyable afternoons!



Staff Profile: Jeff Krause

By Joel Feiner,
Computational Science Intern

Shodor has a tradition of hiring interesting people to do interesting work. Jeff Krause is no exception. Jeff started working at Shodor late in the fall of 2006. His main focus here is on developing curriculum and workshops, as part of the National Computational Science Institute (NCSI), for teaching faculty how to use computational tools in biology and chemistry. "I believe very strongly in the Shodor mission," Jeff says, referring to Shodor's goal of teaching faculty and students alike how to use computers in science.

Over the next few months, Jeff plans to work with other members of NCSI to prepare not only for the Supercomputing 2007 Conference, but also to begin teaching NCSI workshops around the country later this year and into 2008. In addition to teaching workshops for faculty, he also plans to teach workshops for students here at Shodor, as well as quality checking—and teaching interns to quality check—resources for the CSERD digital library.

Jeff started out at "Cal Poly" (California Polytechnic) in San Luis Obispo where he majored in aeronautical

engineering. However, Jeff says he spent more time riding a mountain bike than going to class! He also found himself becoming interested in psychology and how the mind works, so he transferred to the University of California, Irvine, where he majored in psychology. He eventually added a major in biology after working in a psychobiology lab on the recommendation of one of his advisors.

He went to graduate school at Duke where he received a Ph.D. in neurobiology. After spending a few years in post-doctoral research at Duke, he went on to work at UNC's Institute for Science Learning. At UNC, he was mainly involved in a project to create a "genomics media book," a high-end learning tool for teaching about genomics and current biology. The program was unfortunately disbanded after about two years. At the same time, however, Shodor was looking for a specialist in computational biology. Fortunately for us, Jeff ended up here after being referred by colleagues who were aware of Shodor.

Jeff is 17 years married to a talented landscape

archi
three
They
just r
about
and
when
the e
down
locat

Redesigned Apprenticeship Program Gathers Speed

By Warren Myers, Computational Science Intern

Phase Two of Shodor's SUCCEED Apprenticeship Program (SAP) has reached the midpoint of the year at a fast pace. This fall, we had enough new apprentices that we split the group in two and held workshops for them on alternating Saturdays. Workshops covered a wide range of topics: **Unix, operating system basics, searching for materials online, web page design with HTML and Cascading Style Sheets**, and a pair of half-day 'CybAdventure' activities held at North Carolina Central University.

As a core component of each workshop day, the students were given a "challenge"—a project that built understanding of the day's material through practice with the day's topic. **The completion of all such challenges qualifies apprentices for a stipend.** Apprentices then move on to more challenging classes and projects.

Simultaneous with the workshops was open office time for apprentices to come in and work on their challenges. Most of our apprentices moved beyond their issued challenges quickly. This program has also allowed me and other interns to take on a greater role at Shodor through both more **teaching experience** and in **mentoring apprentices** through their projects.

As the fall school semester came to a close, the apprentices had a chance to spend more

time working at Shodor, individually and in small groups. By the end of the year, most groups had created and presented **web sites**, showing the apprentices' quick grasp of web design. Their willingness to play around with some of the less-frequently used features of styling and unusual display logic gave other apprentices, interns, and staff a different way of looking at similar information.

We also provided a series of math quizzes for our apprentices to complete to use as a personal assessment of their educational progress. As the semester progressed, **noticeable improvement** was seen across the **entire apprentice community**, which showed both that they were willing to learn, and that they were taking these weekly quizzes as a challenge to do better in school – and on their work here at Shodor.



We are excited to see how far the apprentices will get this spring term with new challenges they have not seen before, and how they will take that opportunity to surprise the staff with their creativity in solving problems. Early plans for our upcoming summer program are focusing around utilizing our apprentices to document workshops and to assist in teaching.



...tect named Lydia, and between them they have
...e children: Joshua, 8; Zachary, 6; and Sophia, 2.
...y also have two dogs. Jeff loves photography and
...recently got a very nice camera which he is "nuts
...t." He also claims to be one of the rare dual Duke
...Carolina fans (although he says he roots for Duke
...n both teams play each other). Jeff refuses to use
...levators in our building and instead runs up and
...n the stairs, sometimes many times a day (we are
...ed on the eleventh floor of our building).

SUCCEED Spring/Summer 2007 Calendar:

Event	Dates	Times	Grade Levels
Saturday Explorations in Science and Mathematics	Feb 17, 24; Mar 3, 10, 17, 24	9am-Noon	Rising 6-8
Shodor Scholars Program, Session A	June 18-29	9am-4pm	Rising 9-11
Modeling Your World	July 9-13	9am-Noon	Rising 6-8
Forensics	July 9-13	1pm-4pm	Rising 6-8
Engineers in Training	July 16-20	9am-Noon	Rising 6-8
Math Explorations	July 16-20	1pm-4pm	Rising 6-8
Environmental Science	July 23-27	9am-Noon	Rising 6-8
Biomedical Science	July 23-27	1pm-4pm	Rising 6-8
Graphics and Visualization	August 6-10	9am-4pm	Rising 9-11
Shodor Scholars Program, Session B	August 13-24	9am-4pm	Rising 9-11

**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

WD Hill Community Center Takes CyberInfrastructure Hands-On!

By Lateasha Shirer,
Computational Science Intern

As part of the Pathways to CyberInfrastructure project, in which we assist with "other people's workshops," Shodor has been teaching in the W. D. Hill Community Center's after-school program, near North Carolina Central University. Shodor's workshops promote active participation in computational science by engaging the students in science, math, and technology.

Shodor's collaboration with the W.D. Hill center began this summer, when we taught classes there every week for 6th to 8th graders as part of the center's summer camp. This fall, the classes continued as a **computer enrichment component added to the normal after-school program**. The classes took place every Tuesday afternoon from 4:00 to 5:30 for students from grades K-7. Including the summer classes, there have been **23 classes taught at W.D. Hill so far**.

I was fortunate to teach the W.D. Hill classes this fall. Focusing on introducing the students to the theory and practice of computational science, I revised Shodor's materials and lesson plans to make them more understandable for a younger audience. I introduced the students to many different concepts, including **physics, statistics, geometry, and physical science**. The students participated in a number of computer and hands-on activities. I think the students have a better understanding when they learn hands-on. The lessons keep the children learning in a fun and inquiry-based way.

The classes are going great so far—I have



a good group of students and they really enjoy my lessons. Shodor will continue workshops at W.D. Hill this spring.... For more information, please visit www.shodor.org/cyberpathways.

Online Math Activities for Kids

By Heather Marvin, Computational Science Intern

We hear them, see them, and feel them in the rhythm and routine of our daily lives. What elements are these? Patterns! It is natural for the human mind to search for and identify patterns. Patterns are any elements of design, shape, color, rhythm, or motif that repeat in an expected manner ranging from simple to complex.

The **Pattern Generator** activity allows you to explore, learn about, and recognize various patterns using shapes, letters, and numbers

by filling in the missing pieces of the pattern. You are able to select the level of difficulty (easy, medium, hard, or all) of the patterns used in the activity. The images below show the interface of The Pattern Generator activity. After examining the pieces of the pattern already in place, you can click and drag the missing pieces onto the board to complete the pattern.

The Pattern Generator is an excellent aid in helping students develop different

critical thinking approaches to understanding patterns, such as counting the shapes or colors, or looking for a visual pattern such as lines or diagonals or other shapes occurring on the board. This activity can be used to introduce patterning used in other Shodor Interactivate activities such as the **Coloring Multiples in Pascal's Triangle** and **Sierpinski's Carpet** activities. To use the Pattern Generator go to <http://www.shodor.org/interactivate/activities/PatternGenerator/>.

