

## AMSER Spotlight: CAUSEweb.org

AMSER frequently teams up with other digital collections so that we can bring the excellent materials from these collections directly to AMSER users. In each issue of our AMSER Quarterly we highlight one of these collections, and in this issue we are highlighting the Consortium for the Advancement of Undergraduate Statistics Education (CAUSE). The mission of CAUSE is to “support and advance undergraduate statistics education in four target areas: resources, professional development, outreach, and research.” In each of these areas CAUSE also has specific goals. For example, with professional development they work to “coordinate, develop, and disseminate opportunities, programs, and workshops for teachers and others involved in statistics education projects and initiatives.” Their resource goals resources include working to “collect, review, develop, and disseminate resources for members of the undergraduate statistics education community.” CAUSE is funded by NSF, and is part of the National Science Digital Library (NSDL). Some of the members of CAUSE include Ball State University, Monroe Community College, Mayo Clinic, Grinnell College, and Virginia Tech.



The primary vehicle for accomplishing their goals is through their website, CAUSEweb.org. Here visitors will find a plethora of statistics resources from lectures to multimedia. In addition, visitors can learn more about statistics



research, workshops, news, and the aforementioned professional development. AMSER is pleased to have partnered with CAUSE and believes that AMSER users will find this addition to our collection exceptionally useful. Some examples from this fine collection include:

### Confidence Intervals

<http://www.causeweb.org/repository/statjava/CI.html>

The applets in this section of Statistical Java allow you to see how levels of confidence are achieved through repeated sampling. The confidence intervals are related to the probability of successes in a Binomial experiment. The main page gives the equation for finding confidence intervals and describes the parameters ( $p$ ,  $n$ ,  $\alpha$ ). Each applet allows you to change a different parameter and simulate sampling to demonstrate the long run proportion of intervals that contain the true probability of success. The applets are available from a pull-down menu at the bottom of the page.

### Introduction to Statistics: Mean, Median, and Mode

<http://www.shodor.org/interactivate/lessons/IntroStatistics/>

The goal of this lesson is to introduce the concepts of mean, median and

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mode and to develop understanding and familiarity with these ideas. The activity lets students explore mean and median in an efficient way and the discussion helps them to formalize their knowledge of measures of center.

### Can You Beat Randomness: The Lottery Game

<http://polymer.bu.edu/java/java/winning/WinningStreak.html>

From Boston University’s Center for Polymer Studies, the Can You Beat Randomness? : The Lottery Game applet is a simulation of flipping coins. The lesson is taken from Fractals in Science and was developed by Paul Trunfio and Gary McGath. In this applet, students are asked to make conjectures about randomness and how certain strategies affect randomness. It strives to show the

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“growth of order out of randomness.” This is a great resource for any mathematics classroom interested in statistics and probabilities.

### Significance of the Difference Between Two Independent Proportions

[http://faculty.vassar.edu/lowry/propdiff\\_ind.html](http://faculty.vassar.edu/lowry/propdiff_ind.html)

This website, created by Richard Lowry of Vassar College, calculates the z-ratio and associated one-tail and two-tail probabilities for the difference between two independent proportions. The page is very flexible in design, it allows the user to manipulate many different aspects of the statistics.

### Rice University's Virtual Lab in Statistics: Mean and Median

[http://www.ruf.rice.edu/~lane/stat\\_sim\\_descriptive/index.html](http://www.ruf.rice.edu/~lane/stat_sim_descriptive/index.html)

This applet, created by Rice University's Virtual Lab in Statistics, allows students to manipulate a histogram and observe changes in the mean and median. The site includes links to exercises and descriptions of measures of center and spread. Overall, this is a nice learning device to teach students about statistics, and more specifically, histograms.

You can find the CAUSE website online at: <http://www.causeweb.org/>

*Do you know of a great collection of resources that you'd like to see integrated into AMSER? Do you have a learning object that helps students truly understand a specific concept? If so, e-mail us at [resources@amser.org](mailto:resources@amser.org), or follow the link at the bottom of the AMSER home page to submit a resource suggestion.*

## A Letter to the AMSER Community

As you may know, AMSER first received funding from NSF as a NSDL Pathways project in 2004 and then again in 2008. We were funded as a collaborative project and were designed to meet the needs of community and technical colleges and to forge a link between these communities and NSDL. AMSER staff believes that connecting community and technical colleges to valuable STEM resources like those found in NSDL is of critical importance, as these institutions train a significant percentage of our workforce and act as a bridge between secondary and baccalaureate education. Educators from this community are very much in need of what NSDL and AMSER provide: freely available authoritative online applied STEM education resources. Although almost half of our nation's undergraduate students attend these schools, they receive only one-fifth of the monies spent on post-secondary education. In addition, enrollment at these institutions is increasing exponentially, as these institutions face budget cuts and staffing shortages.

Over the years, AMSER has worked to provide a valuable source of applied STEM resources and a host of other tools and services for educators including bulletins, folders, the *AMSER Science Reader Monthly*, and the *AMSER Quarterly*. We have constantly upgraded and updated the resources in AMSER and have focused on making AMSER's collection, services, and publications, as robust and cohesive as possible based on user feedback.

This year the National Science Foundation announced that it could no longer continue to support the NSDL funding program as of September 30, 2011. While this does mean that many of the initiatives within NSDL will be

winding down, others will continue to move forward. The AMSER team is incredibly thankful for NSF's generous support over the last seven years, and we look forward to continuing our relationship with them in our current and future projects.

The AMSER repository will continue to be maintained and the resource collection will still be expanded – just at a bit of a slower pace. As AMSER's current funding ends in October of 2011, we will stop publishing the *AMSER Quarterly* and *AMSER Science Reader Monthly* as well as cease posts on Facebook and Twitter.

If you are interested in updates about new STEM resources we encourage you to subscribe to our sister project – *The Scout Report* (<http://scout.wisc.edu/report/>). This online report is a free weekly publication that provides readers with exemplary online resources of interest in the humanities, sciences, and math. Many resources from the *Scout Report* land in the AMSER collection. You can subscribe to the *Report* via e-mail, read it online, or find it on Facebook and Twitter.

We have enjoyed working with the AMSER community of users and look forward to continuing our work together. Sincerely, The AMSER Team

*Want more STEM educational resources? Follow us on Twitter @IntScout or find us on Facebook at [Facebook.com/InternetScout](https://www.facebook.com/InternetScout). We'll keep you connected with updates on STEM resources, STEM events, and many other entertaining and educational resources, articles, events, and more.*

## AMSER User's Corner

AMSER staff members spend quite a bit of time scouring the Internet for high quality resources to include in the AMSER portal. Sometimes we are looking for a specific subject suggested to us by an AMSER user and sometimes we just happen upon something great. Here are some of our favorite finds.

### Teaching Resources: Botany and Plant Pathology

<http://www.ag.purdue.edu/btny/pages/teachingresources.aspx>

Whether you are a tried and true botanist or just getting started, this website from Purdue University will be an invaluable resource for educators, students, and others with an interest in plant pathology and allied fields. The lessons, links, and teaching materials here are divided into five sections, including "Presentations", "Slidesets", and "Professors in the Classroom". For starters, the "Professors in the Classroom" area contains a brief introduction on the relevance of agricultural research from Professor Ray Martyn and a similar feature on genetically modified organisms (GMOs). The "Slidesets" area contains high-resolution images of various plants compiled by Professor Gregory Shaner for a botany courses. The site is rounded out by the "Teaching Materials" area, which features several lesson plans about fungi.

### CSERD: Computational Science Education Reference Desk

<http://www.shodor.org/refdesk/>

The Computational Science Education Reference Desk (CSERD) is part of the National Science Digital Library (NSDL) and it receives funding from the National Science Foundation (NSF). The aim of the CSERD is "to help students learn about computational science and to help faculty and teachers

incorporate it into the classroom." First-time visitors can learn more in the "Getting Started" area and they can also sign up to create their own account to store various resources for future use. Users can dive right in by clicking on the "Featured Collection" on the left-hand side of the page and there's even a "featured Virtual Manipulative" that's worth a look. The site also contains a special area for students ("For Students") and one "For Educators" that includes information about upcoming educational workshops. Also, the Journal of Computational Science Education is worth a look as well. Finally, educators are also encouraged to submit their own resources for inclusion within the CSERD's metadata catalog.



### National Soil Survey Center Soil Science Education Website

<http://soils.usda.gov/education/>

The National Soil Survey Center is part of the Natural Resource Conservation Service and the United States Department of Agriculture (USDA). Their Soil Science Education Website's motto is "Helping People Understand Soils," and accomplishes this by offering an explanation of what soil is, its formation and classification, what the soil survey is, and soil movement regulations. The site also provides links to a soil science glossary, photo gallery, and much more.

### Financial Education in the Math Classroom

<http://mathforum.org/fe/>

The Math Forum at Drexel University has a website that focuses solely on teaching financial education in the math classroom. This wonderful resource provides curricula, weekly problems, and forums for teachers using the site's resources. Visitors will see that the site has two main topics: "Finance Topics" and "Math Topics". In the "Finance Topics" area visitors will find such areas as "Interest Rates", "Mortgages" and "Spending". Visitors should look at the exercise which teaches students that "interest never sleeps" in the "How Long Will it Take to Pay Off My Credit Card?" area. Under the Math Topics link, visitors will find such essentials as "Fractions, Decimals & Percents", "Ratios & Proportions", and "Polynomials". "Bartering for Bananas" is an exercise that teaches students that when "thinking about financial choices, we often consider trade-offs and ratios and proportions offer a great way to model those trade-offs exactly."

### Exploring Life's Origins

<http://exploringorigins.org>

This visually arresting website is part of a multimedia exhibit at the Museum of Science in Boston, which aims to "use molecular illustration and animation to help describe origins of life research and theories to broad audiences." Visitors should check out the "A Timeline of Life's Evolution" to get oriented to the site. The "Formation of the Moon" is a stunning artist's rendition, as is the "Formation of the Solar System". Dragging the red marker on the timeline at the top of the page reveals images of important events in earth's history. Visitors interested in a more microscopic view of life will

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## Focus on AMSER Resources

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enjoy the exhibit "Understanding the RNA World?", where they will find a short narrated animation. Educators and others who are interested in downloading any of the videos for educational purposes can do so from the "Resources for Educators" link at the bottom of any of the site's pages.

### Spider in Space Mission Page

[http://www.bioedonline.org/space/STS\\_Mission\\_134S.cfm](http://www.bioedonline.org/space/STS_Mission_134S.cfm)

Beyond the bounds of the Earth's atmosphere, two golden orb spiders are living on the International Space Station. Each lives in a separate habitat, and they have a bountiful supply of fruit flies. Each chamber contains cameras and lighting systems, and visitors to this site from BioEd Online can peer into their world. BioEd Online also provides an amazing teachers guide, along with a dozen or so spider videos. Educators should take advantage of the collection of links to pamphlets on the operation of rockets and microgravity.



*Would you like to be featured in a future AMSER Quarterly? We'd love to hear from you and learn about your favorite AMSER resources and how you've been using them in an educational setting. Please e-mail us at [amser@amser.org](mailto:amser@amser.org) for details.*

## Calendar of AMSER Events

### Where in the world is AMSER?

We'll be at various conferences and meetings this year and we'd love to talk to you about what you're doing with digital resources and how we can make AMSER more useful to you and your students. Here's where we'll be and when:

October	November	December
<b>STEMtech Conference</b> October 2-5, 2011 Indianapolis, IN	<b>Association of Career and Technical Education (ACTE) Annual Conference</b> November 17-19, 2011 St. Louis, MO	<b>Coalition for Networked Information Membership Meeting</b> December 12-13, 2011 Washington, DC
<b>ATE PI Annual Conference</b> October 26-28, 2011 Washington, DC		

For more AMSER events and links go to <http://www.amser.org/events>

## Contact Information

Have a question? Want to share information about how you're using AMSER or other digital materials in your classroom? Please contact us!

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## Get More AMSER

Sign up to receive the AMSER Quarterly! Be assured that we'll only e-mail you if we've got something valuable to share. E-mail us at [amser@amser.org](mailto:amser@amser.org) if you would like to be added to our mailing list.

### This document is available in alternate formats.

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