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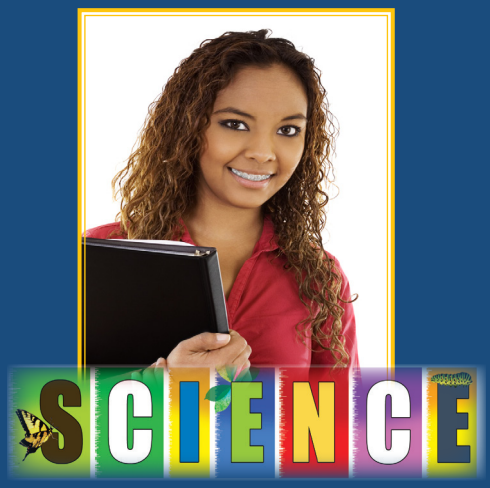

Engage your Students with Forensic Science Lab Acitivites such as "Documenting a Crime Scene" and "Fingerprints."
By: Karalyn Ramon

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Bringing a World of Data Into the Classroom

By: Michael Jabot, Ph.D. & Ann Deakin, Ph.D.

State University of New York at Fredonia

What a great time to be teaching science! Never has there been a greater convergence of current issues, strong commitment toward environmental issues and emerging digital technologies. This convergence gives those teaching using the ***Global Science*** curriculum some remarkable opportunities. This article focuses on some of the ways we can take advantage of this unique time.

The first digital technology that we can take advantage of is that of Geographic Information Systems (GIS). For time on end, maps and the data they represented have been used to inform the decisions of man. GIS allows for vast amounts of data to be presented visually in the classroom and can be used by students to answer questions about their world and contribute to solutions to many of the most pressing problems facing society today.

There are a number of resources that can be used to bring GIS into the classroom. As an example, ArcGIS Online (www.arcgis.com) is a web based way of allowing students to investigate current events such as wildfires and weather patterns and then share their analysis with others. Students can take advantage of ArcGIS Explorer (http://explorer.arcgis.com), an easy presentation tool, to develop visual presentations of their GIS analysis and present their findings in a professional manner. These tools are simply an example of the ways that GIS can be introduced. A number of sites and brief description of the data they contain is included at the end of this article.

While we can quite easily introduce students to existing real-world data, we can also take advantage of the opportunity of having students collect this real-world data and contribute to those interested in solving questions. As an example, a number of solutions for students to use technology to collect data in the field are now available. Many of these solutions also combine the ability to collect data with global positioning data. This allows the students data to be easily mapped and shown visually. For instance, one group of students recently conducted a stream study of a nearby waterway. The students collected data including the flow rate, temperature, pH, and dissolved oxygen content and then uploaded this data to GoogleMaps™ (Maps.google.com). The student's could then analyze these data to investigate any trends that might need further investigation. The students then shared these data with another group of students who had used GPS while doing a biological survey of the same stream. These two groups could then look at the connections between the physical and biological systems of the stream to draw powerful conclusions. The interesting thing about this whole project, was that it was proposed by the students based on their participation in a stream cleanup project on this body of water. What a fantastic way of bringing student interest in helping their community to life.

The examples mentioned here offer only a small glimpse into the ways that digital technologies can bring our classrooms to life. Other students have done vodcasts of their work that have been shared with others who were interested in helping others learn more about the watershed and to identify and map invasive species. Others have developed data sharing systems where other student scientists contribute their data to a database that can be used as a teaching resource by teachers in the partnering schools. The uses of these technologies is truly endless! If you would like more information please feel free to contact Mike Jabot at (jabot@fredonia.edu).

Selected Resources:

National Atlas of the United States.
(http://www.nationalatlas.gov/)
Both the Map Layers and Dynamic Maps links provide
the opportunity to map a variety of natural science data sets.

National Park Service Maps
(http://home.nps.gov/applications/hafe/hfc/carto.cfm)
Allows students to view data on any National Park

Weather Underground (http://www.wunderground.com/US/Region/Northeast/Temperature.html)

Daily Weather Maps from 1871.
(http://docs.lib.noaa.gov/rescue/dwm/data_rescue_daily_weather_maps.html)
Requires a plug-in which can be downloaded from the NOAA site. Maps are static - just scanned images but have some great uses.

Interactive Global Geostationary Weather Satellite Images
(http://www.ghcc.msfc.nasa.gov/GOES/)
This site allows students to look at weather satellite data real-time and animated if they like.

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MoTV8ng Digital Lrnez: Making Technology Central to Teaching & Learning

By: Patreka Wood
New Teacher Developer
Kendall Hunt Educational Consultant

Today's students spend a countless number of hours texting, emailing, playing video games, on social media web sites and listening to digital audio device. These digital learners are constantly absorbing and filtering information via a computing device. Students are excellent multi-taskers, they text while watching TV or playing video games and listen to their iPods while surfing the web. When these digital learners enter our classrooms; the first thing we ask them to do is to turn off and stow away all of their electronic devices. We require them to sit for hours with minimal opportunities to interact with technology or digital media. Most school districts have strict policies against the use of cell phones during school hours. Many even block social networking and gaming sites. So, how do we as educators engage digital learners; and help them to be truly media literate students who are capable of collaborating online in a research-based environment in which they are reflecting, evaluating, analyzing and creating new knowledge? Here are a few strategies that I share each year with new teachers that I mentor:

Survey your class using Google Forms:
If one of your first day activities includes having your students fill out an index card with their parental or guardian contact information or a welcome sheet to learn more about your students' interest, try having your students complete an online survey. Google has created an easy to use application that allows you to generate a survey or form that can be shared with anyone via e-mail. The results of the survey are compiled in a spreadsheet that can be easily sorted, exported and analyzed. Google forms can also be used for computer-based quizzes. The possibilities are endless; all you need is a free Google account.

Build a class wiki or have your students use wikis for projects:
Many wiki sites like Wikispaces or PBwikis provide free, easy to build wikis for educators. Wikis can be designed to provide space for your students to collaborate online, conduct peer evaluations and as a portal for communicating with parents. In ***BSCS Biology: A Human Approach***, there are many activities that require students to brainstorm and collaborate in a group. Often these groups record their ideas on chart paper. What if these ideas where captured on a wiki page instead of paper? The wiki page makes it easy to revise and share each group's ideas, with not only the students in their class, but with students in other biology classes as well. Standard notes that would have been recorded in a science notebook are now available for everyone to critique and evaluate. Imagine if each of your students created a wiki to organize information about their Critter. You would no longer need a file cabinet or milk crate to store their Critter projects, all you would need is a computer and Internet access. Updating, evaluating, and sharing the Critter wiki can now be done with a click of the button.

Have your students form Wiggio groups:
Group projects are an excellent way to assess what your students have learned. Yet, the challenge with group projects is finding time for the group members to collaborate. Social network sites like Facebook, Twitter, and Oovoo are very popular with teenagers and could provide a method for groups to collaborate, however most school districts block access to these social networking web sites. An alternative to Facebook is Wiggio. Wiggio is a free online toolkit that makes it easy for groups to collaborate. Now, instead of providing class time or meeting after school, students can collaborate online. Group lab reports or projects like the Health Care Proposal can be worked on as a team using Wiggio's chat rooms, file uploads, virtual meetings and messaging features.

Use Teachers' Domain for digital media:
If you're looking for video clips on a variety of science topics visit Teachers' Domain. Teachers' Domain is a digital media web site that features videos from Nova and Nature, support materials and lesson plans for educators. When you get to the Chapter 2 "Engage: Lucy in *A Human Approach*", you should consider showing the videos "Becoming a Fossil" and "Finding Lucy". "Finding Lucy" is a four-minute video that features Don Johanson's expedition that led to the discovery of Lucy. The "Becoming a Fossil" video-clip describes how Lucy's fossil was formed. This is just a sample of the digital media library housed in Teachers' Domain. The videos can be shared with the entire class using a projector or students can view the videos on individual computers during school or at home.

The activities and experiments in ***BSCS Biology: A Human Approach*** can easily be enhanced to motivate the digital learner. The obvious challenge of technology integration is access to computers. Many teachers hesitate to require their students to use web-based applications because they have limited Internet access at home. In reality, most students can access the web via their cell phones, hand-held gaming devices like the PSP, libraries and computer labs after-school. A quick survey at the beginning of the school year would quickly indicate which students have access to the Internet. The benefits of student engagement far outweigh the challenges of technology integration. Teachers' Domain, Wikis, Wiggio and Google Forms are just a few ways to engage students with technology. Whichever web-based application or digital media you choose, your students will learn to be media literate and will develop 21st century skills that will help them to compete globally.

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Starting Off the Year Successfully with Forensic Science

By: Karalyn Ramon
Science Teacher
Kendall Hunt Educational Consultant

A great, engaging first activity for a Forensic Science unit or course is "Documenting a Crime Scene." At the start of the class students are given four questions to answer to assess their prior understandings (or misconceptions) about Forensic Science. For this activity, students are asked:

- What is forensic science (or CSI)?
- What is evidence? Can you give an example?
- Why would it be important to preserve and/or record a crime scene?
- How might you preserve and/or record a crime scene?

Students write their answers in their laboratory journal and then the class discusses. After the discussion, students are given an overview of the field of forensic science and are then introduced to the basics of documenting a crime scene (sketching, note taking and photography). As an example, students are asked to observe the classroom as if it were a crime scene and discuss what items would be worthy of note. Students are also shown examples of the various methods to document a scene.

Students then break out into CSI teams, create a crime scene and document it using sketches, notes and photographs. Students break into groups of four. Each CSI team will consist of:

1. A Team Lead:
   - The team lead secures the scene and directs the work of the other team lead. They can also serve to take notes on the scene (compass directions, weather, measurements, evidence found, etc.)

2. A Photographer:
   - The photographer uses a digital camera to produce a series of images of the scene (three sets of four – overview, intermediate and close-up)

3. A Sketch Artist:
   - The sketch artist produces a rough sketch of the scene.
   - It is not important to worry about scale at this point but measurements of the scene should be taken.

4. A Victim:
   - Some enhancements of this activity is to provide the team with sidewalk chalk to produce an outline of the body and/or crime scene tape and evidence tags.

At the end of the activity, the instructor selects a few sample photos from some of the teams to illustrate good technique. The homework assignment for the day is for each student to produce a formal crime scene sketch of a room in their home.

One of the most popular lab activities in Forensic Science is "Fingerprints." This lab is especially engaging as students have seen dusting for prints or other latent print developing techniques on popular TV shows or in movies. To begin this activity, students are given four questions to answer to assess their prior understandings (or misconceptions) about fingerprints. For this activity, students are asked:

- What is a fingerprint?
- Why are fingerprints such a valuable piece of evidence in forensic science?
- Can an invisible fingerprint be made visible? How?

Students write their answers in their laboratory journal and then the class discusses. After the discussion, students pair up and take each other's fingerprints using ink pads, fingerprint charts and hand lenses. After observing their own fingerprints the instructor displays examples of the three main types of fingerprints (arches, loops and whorls). The instructor then displays an enlarged print to demonstrate ridge details. Students then hear about the Hamm Kidnapping, an excellent case study that details one of the earliest techniques of developing latent prints.

In the lab, students experience three techniques for developing latent fingerprints: dusting, iodine fuming and fuming with super glue (cyanoacrylate reaction). To begin, students practice dusting for prints. Each student is given a glass microscope slide, a paint brush and dusting powder. Students generate a latent print on the slide and then use the dusting powder to develop the print. This technique takes some practice, and students are free to wash their slide and try again until they are comfortable with the technique.

Students then pair up and produce three pieces of evidence. A student will leave a latent print on: a glass slide, a piece of paper and a metal spoon. The group leaves their evidence in a labeled plastic bag and exchanges it with another team. The other team dusts the glass slide for prints using one of three different dusting powders. Once the print is visible the team lifts the print using transparent tape. To visualize the print on paper, the team places the paper in a small jar (baby food jars are excellent for this) with a small amount of iodine crystals or liquid Lugol's solution. To visualize the print on the spoon, the team will place a small piece of aluminum foil in a plastic Tupperware® or Ziplock® container. They then add a dime-sized amount of super glue to the aluminum foil. The spoon is then placed in the container (ensuring not to glue the spoon to the foil) and sealed. Once all of the prints are visible the team can compare the developed prints to the fingerprint charts of their "suspects." To conclude this activity, students read a case study about the 2004 train bombing in Madrid, Spain. This is a good way to illustrate the potential for error in crime scene investiagtion.

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Professional Development

Online Professional Development Resources

E-Workshops:

Kendall Hunt offers curriculum-specific training through 90-minute E-Workshops. E-Workshops are an affordable way to receive live professional development through the use of your computer (to view, listen, and participate in the workshop). All workshops consist of standards-based content and will be presented by experts in the field of education.

Some E-Workshops will require attendees to bring teacher materials for their reference and to create a hands-on experience. Participants registered will be emailed a certificate acknowledging 1.5 professional development hours acquired per E-Workshop attended.

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Mark Your Calendar!
National Professional Development Conference
July 26-28, 2011
Chicago, IL
For details visit:
kendallhunt.com/pdconference

Fall 2010 E-Workshop Schedule

October:

Introduction to *Project M³*
Tuesday, October 12, 2010

***CFGE:* Introduction to Language Arts**
Wednesday, October 13, 2010

Introduction to *KH Chemistry*
Tuesday, October 19, 2010

Introduction to *Math Trailblazers*
Thursday, October 21, 2010

Introduction to *BSCS Science: An Inquiry Approach*
Tuesday, October 26, 2010

November:

Introduction to *Project M²*
Thursday, November 4, 2010

Introduction to *BSCS Biology: A Human Approach*
Tuesday, November 9, 2010

***CFGE:* An Introduction to Science and Social Studies**
Wednesday, November 10, 2010

Introduction to *Forensics Science for High School*
Tuesday, November 16, 2010

***Project M³:* Verbal Communication: Using Talk Moves in the Classroom**
Thursday, November 18, 2010

All E-Workshops run from 4:00 - 5:30 PM EST
Register at: Kendallhunt.com/k12webinar

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Kendall Hunt Supports National Lab Day

National Lab Day is a nationwide initiative to build local communities of support that will foster ongoing collaborations among volunteers, students and educators.

May 12, 2010 was the first National Lab Day. As a strong supporter of National Lab Day, Kendall Hunt Publishing and its employees promoted the inaugural event by spending time in classrooms working with students on hands-on science activities. Kendall Hunt is known for publishing research-based, NSF-funded, and inquiry-based science programs, so National Lab Day was a perfect opportunity for us to step to the forefront and lend a hand.

Charley Cook, Vice President of PreK-12, joined fellow KH employees Joe Haverland, Pam Roth, and Wayne Schnier at John F. Kennedy Elementary School in Dubuque, Iowa, where they conducted hands-on science activities with the 1st and 4th grade classrooms. Joe facilitated a Physical Science activity focusing on Equilibrium and Center of Gravity, which challenged the 4th grade students to work in groups to try to figure out a way to balance eight nails on the head of one nail. The students worked in pairs, which promoted teamwork that is critical to the inquiry process. Everyone enjoyed seeing students collaborating and sharing ideas.

Although they were only 4th grade students, the problem-solving skills they exhibited are those they need to have to not only cope, but also be competitive as they advance through school and enter the working world. The students did a great job and by the end of the exercise, each group was successful in balancing all of the nails.

Wayne Schnier and Pam Roth were in a "stickier" situation when they worked with the first graders on the "Gloop" activity from the Kendall Hunt elementary science program BSCS TRACKS Investigating Properties Kit. Gloop is a mixture of glue, starch and borax made the day before the activity and kept sealed in a plastic container to keep moist and somewhat hardened. Before the students could open the bag, they had to guess what ingredients were in the Gloop. That exercise provided an entertaining and informative classroom conversation. Next, the students were allowed to open the bag and then listed the properties of what was contained in Gloop. They also tried to come up with ideas on how gloop could be used if it was manufactured for the public. The kids were having a great time with this activity. It is clear that the Ggloop itself adds to the excitement, but it makes science fun for kids and they use all of their senses for this experiment.

For Kendall Hunt, National Lab Day was a big success. Our employees enjoyed spending time in these classrooms helping students experience science in a hands-on way and gain problem-solving skills that will last a lifetime. As a nation, we are learning how important science is if our country and its citizens are going to remain competitive in the future. At Kendall Hunt, we want to make Lab Day an everyday event for all students, and we are eager to play a role in their success.

Read more about National Lab Day on our web site by clicking ***here.***

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