Urbanization affects our waterways in many ways. Not only can urbanization affect the chemical and biological health of a stream, but it can also change a stream’s physical characteristics. It is not uncommon to find urban streams whose natural streambeds have been replaced by concrete channels or once meandering streams that have been straightened (channelized). Still other streams are redirected. Their natural course is rerouted. The structures used to redirect stream channels are referred to as culverts.

The reasons for such drastic alterations of streams abound and some address legitimate concerns. Areas that are being built up are often to blame. At times, the measures are taken to protect property in floodplains. As you might suspect, the stream’s health does not go unaffected by such physical changes. Natural stream flow can be severely disrupted, as can the natural boundaries of watersheds; stream substrate can be homogenized reducing the biodiversity the stream can support; concrete channels are impermeable and can increase flood potential; and reduced or excessive shade changes the types of life that can survive in such habitats.

More and more people are discovering that these detrimental changes are occurring right in their own backyards. Students at Springdale High School are preparing to sample at a site that is affected by urbanization and development. Can you imagine how salt-laden runoff from the bridge that gets into the creek affects water quality?
Urbanization & Sprawl Affect Creek Quality

Urbanization also occurs when people move out of the city and into the suburbs, expanding suburban boundaries farther and farther into once rural areas. Urbanization can have negative effects on water quality, including erosion and sedimentation increase, excessive runoff addition, pollution, destruction of beneficial riparian forest buffers, and water-borne pathogens release.

Urbanization adds to erosion and sedimentation through the clearing and grading of land for development. You may have noticed that urban waterways generally have very few trees and little vegetation along their banks. Without vegetation, soil becomes loose and can easily be eroded (carried away) by wind and rain. This soil then can enter a waterway and damage that waterway. When soil is added to a waterway, turbidity is increased and nutrients are increased creating unhealthy conditions for macroinvertebrates and fish. Sedimentation (settling out of sediment and debris) at the bottom of the creek smothers aquatic habitats, suffocating macroinvertebrates and bottom feeding organisms. Construction development of land can also exacerbate sedimentation by creating flat, impermeable concrete surfaces that easily become covered with precipitation. Unable to soak into the ground, this precipitation then washes any materials that are on the surface of the concrete into nearby waterways. The materials that are carried into streams can be anything from dirt to garbage.

The installation of storm sewers is another development of urbanization that deals with runoff and can have negative effects on water quality. To prevent flooding, storm sewers are positioned beside highways and parking lots to collect water during rainstorms. When the rainwater flows into storm sewers, it collects a variety of materials that are in its path. These materials often include road salt, oil and other chemicals that leak from cars, paper and metal trash litter, and rubber from tires. Materials that the water collects on its way to a storm sewer are then carried into a nearby waterway, thus polluting the waterway. Trash from urban runoff can change the temperature of waterways as well as alter levels of alkalinity, turbidity, nutrients, pH, and total dissolved solids, often making the water inhospitable to aquatic life.

To reduce the negative effects of urbanization, regulations have been created to promote the development of land with reduced impacts on the environment. Methods have also been set up to prevent foreign materials from reaching waterways. Another way to reduce the effects of urbanization is to ask yourself, “How is my water use and my behavior affecting my local waterways? What can I do to prevent further contamination of nearby waterways when making decisions?”

Down the Drain and Back to the Creek:
Cochranton Students Explore the World of Wastewater Treatment

So, you’ve never thought twice about sewage after flushing your toilet? Well, now approximately 40 Biochemistry II students at Cochranton High School are experts on the processes that take place after the toilet flushes. From sewage influent to treated effluent and everything in between, these students in Mr. Grzegorzeki’s 6th and 8th period classes have seen it all.

The Wastewater Treatment Plant Module began in early December when Mr. G introduced students to the topic. The objectives of the module were to make students more informed about wastewater treatment, the processes involved, and the environmental implications. This is particularly pertinent in the lives of Cochranton students because the borough is faced with putting in sewers to replace the wells and septic systems that are currently being used. Cochranton has problems with sewage building up in people’s yards and getting into Little Sugar Creek, a tributary of French Creek. Mr. G’s classes have done water quality analysis of the water in Little Sugar Creek and have noticed sludge in the waterway. They have also observed a significant difference in color between water from Little Sugar Creek as it enters French Creek, and the water in French Creek upstream of Little Sugar Creek.

After learning about the local environmental issues related to wastewater treatment, Cochranton Bio-Chem. II students visited the Meadville Sewage Treatment Plant, run by the Meadville Area Sewer Authority, on December 5th, 2002. As soon as they entered the building, the students began commenting on the rather “earthy” aroma of the plant. After an
Down the Drain and Back to the Creek - continued from pg. 2

introduction by Eric Schall, a representative of the Meadville Sewage Treatment Plant, students began their tour of the facility. They listened intently over the roar of motors and fans to the fascinating journey of raw sewage through the plant. They learned that untreated sewage coming into the plant is called “influent” and the treated sewage leaving the plant is referred to as “effluent.”

Many students were captivated by the complex process of wastewater treatment. Ryan Malliard thought it was particularly interesting “to see how much they have to do to get it so they can use the water in the environment again. It’s a long, continuous process.” Erin Fields agreed, saying, “It was kind of cool to see how everything works. It [the wastewater treatment] comes in from a lot of places in the general region.” Tom Swisher said he “thought it was interesting how everything worked, especially all the pumps and bar screens. Pumps pump raw sewage and the bar screens pick up the large stuff out of the raw sewage.” Alfie Deeter and Chad Beach’s favorite part of the wastewater treatment plant was “how the ultraviolet light killed bacteria.” The big hit of the visit to the plant was walking on the roof and peering down into the gurgling tanks of brown, frothy raw sewage.

The Cochranton students’ experience with sewage treatment didn’t stop after the visit. They used this experience as a springboard to construct mini-sewage treatment plants and produce sludge (the solid material removed from wastewater) using processes similar to those utilized at the Meadville Sewage Treatment Plant. The sewage treatment process is similar to the natural process by which wastewater is cleaned in the environment. Typically, wastewater treatment has two stages: primary treatment and secondary treatment. Primary treatment involves the physical processes of filtration, settling, and skimming. Primary treatment can remove about 50% of contaminants from wastewater. Secondary treatment, which involves biological and chemical processes, can remove as much as 95% of the remaining contaminants from the water that was pumped off after primary treatment. Any remaining contaminants and disease-causing microbes are killed with chlorine or ultraviolet light. A third stage of treatment is sometimes used and mainly involves flocculation, which means adding a coagulant to water which makes the remaining tiny solids clump together. These clumps then settle out. The fully treated wastewater, or effluent, is then released back into the environment.

With these stages of wastewater treatment in mind, the Cochranton Bio-Chem. II students put their craft skills to work to construct mini-sewage treatment facilities out of Plexiglas and several aeration and pumping devices. They constructed primary treatment models and investigated the settling rates of the solids. Each and every student played a pivotal role in the construction of the two activated sludge tanks. Within four class periods, the models were up and running.

The Cochranton classes chose denitrifying bacteria as their microorganism that would consume the contaminants in the wastewater. Once the tanks were up and running and the denitrifying bacteria went to work, students monitored pH, temperature, dissolved oxygen, total dissolved solids, total settleable solids, total suspended solids volume, and turbidity of the wastewater, and did some research into testing for coliform bacteria for two weeks. They used both Hach kits and digital meters to measure the levels of these parameters. Hoon Cho, a foreign exchange student from South Korea, commented that he liked using the digital meters because he had learned about them in South Korea but had never had the opportunity to use them himself.

In addition to chemically analyzing the wastewater, Mr. G.’s students also monitored the sludge produced by their treatment facilities as well as sludge from the Meadville facility. By examining the sludge under microscopes, students were able to monitor the presence and relative abundance of “indicator organisms.” Indicator organisms are certain microorganisms such as rotifers, stalked ciliates, free-swimming ciliates, flagellates, and amoeboids that indicate the level of settling. The relative abundance of these organisms reveals if the sludge has sufficiently settled or not. The Cochranton students greatly refined their microscopy and when the time came to look at the sludge, they had become enthusiastic microscope experts. Sean Culver seemed to really enjoy the microscopy and he thought the whole project was a great idea: “I think it’s awesome because we get to do all kinds of stuff with microscopes and we get to get outside, go in the creek, and look at slides.” Chuck Schultz also enjoyed the microscopy work in the classroom, especially after the visit to the sewage treatment plant. “Looking at the slide at the treatment plant was the coolest part. I saw stuff that was moving in the sludge!” Ryan Hollabaugh was excited when he “identified a flagellate.”

After several months of work on the Wastewater Treatment Module, students used their experiences to compile training manuals for how to operate activated sludge tanks.

Overall, the unit on wastewater treatment was a hit among Cochranton’s Biochemistry II students. Adam Artman summed it up when he said, “It [the project] was different. Good different. It’s been more interesting than some of the other things we could have done.” As a result of the unit, Cochranton sophomores and juniors are more informed about the processes involved in wastewater treatment. They also have a better understanding of the importance of sewage treatment and the environmental issues related to it. They realize that flushing the toilet is only just the beginning of the sewage treatment story!
GIS & Watershed Experts Meet With Frick Creek Connoisseurs

On Friday, January 17, 2003 the eighth grade students from Frick International Studies Academy who participate in Creek Connections enjoyed a presentation from experts on our water system. Our Creek Connections group travels to Nine Mile Run to test the water. Nine Mile Run begins above ground in Frick Park and continues through the park to the Monongahela River. The presentations were

Want to learn more about GIS and the Nine Mile Run Watershed Association?

Check out these links!

GIS sites:
- http://www.gis.com/
- http://www.fws.gov/data/gishome.html
- http://www.epa.gov/epahome/gis.htm

Nine Mile Run Watershed Association site:

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Reiko Goto, Marijke Hecht, and Beth McCartney.

We sat with our testing groups and began by telling our guests what nutrient we test for in the creek: whether it is nitrates or phosphorus. We learned about the watershed and about geographic information systems. We also discovered ways to protect Nine Mile Run watershed from erosion. Beth McCartney is a Geographic Information Systems Specialist who spoke about the topography of Nine Mile Run and showed us elevation maps. Reiko, who is a research fellow at Carnegie Mellon University, brought clay and each group modeled an example of a watershed. Marijka Hecht is a watershed coordinator who is part of the Nine Mile Run Watershed Association, which is an organization dedicated to beautifying watersheds.

Everyone learned many new and interesting facts about the watershed where we live and we owe much gratitude to Reiko, Beth, and Marijke for taking time out of their busy schedules to talk to us.

GIS & Watershed Experts Meet With Frick Creek Connoisseurs

The following article, written by two Bethel Park students, describes the changes to their Greenwald Creek. Kristy and Kyla wrote: After meeting with Martin Marek, Bethel Park Municipal Engineer, it is now clear that the culvert on the stream was necessary. This project is known to the residents of Bethel Park as the Greenwald Flood Protection Project. The culvert is designed to redirect the flow of water from the creek, under Greenwald Road to prevent flooding of the residents’ homes near the creek. The watershed surrounding this creek is about 600 acres so a very large volume of water can drain into it.

The project was initiated by the many complaints of the citizens whose basements were being flooded because the creek would overflow its banks during storms. The culvert would be designed to allow the current to pass under the road during storms. It would hold the current even for one hundred year storms, which are extremely powerful storms that come about once every one hundred years. The last one hundred year storm occurred on July 10, 1974. Some of the homes were flooded so much that their cars in the garages were floating on top of the water that had leaked into their basements.

Many people complained to the local government that something had to be done. As in many environmental dilemmas, they had to weigh impacting the creek’s environmental health and water quality with the safety of the 50+ residents’ homes. Residents questioned how the culvert would impact the creek. Before the culvert could be built, the Department of Environmental Protection had to investigate and an Environmental Impact Statement (EIS) had to be drafted. Bethel Park applied for a permit to build the culvert, it was granted and construction began in March 2002. It is expected to be finished in early March of 2003. The roads and yards that were torn up during construction need to be re-done and are expected to be finished by the end of the summer.

Culvert Improves Flow on Greenwald Creek

Students from Frick International Studies Academy gain valuable hands-on experience by working with visiting experts. They learned more about the Nine Mile Run Watershed Association and Geographic Information Systems (GIS), a technology that combines layers to tell you more about and give you a better understanding of a place.
Parker Middle School Conducts Annual Watershed Snapshot

There was an odd occurrence in the Edinboro community on Saturday morning, March 1. All at the same time throughout the Conneautee Creek Watershed, school vans and parent vehicles pulled off on roadsides, next to bridges, with Parker Middle School students climbing out of them grasping dissolved oxygen bottles and pH meters. It was the annual watershed snapshot for approximately 25 of Mr. Wise’s 8th grade students, concluding a school year of sampling.

The students have enjoyed doing water monitoring this school year and for this Saturday event. Student Danielle McDunn indicated that the water testing is a “good experience because it gets you walking around and learning things.” Andrea Mullen thought the water monitoring was “awesome,” and said, “we should sample creeks more often. It is fun. It gives us a chance to work together as a team.” Teamwork was definitely helpful for all the data collection they would do on their watershed snapshot.

A watershed snapshot is a useful way to determine the health of an entire watershed for a particular moment in time. Taking samples simultaneously in an area keeps the experimental conditions of time and weather constant, allowing for better water quality comparisons between sites. For this sampling event, Parker Middle School students visited nine different stream sites, some of which are influenced by rural surroundings and others by the Edinboro community and development occurring there. By testing each site for the eight typical Creek Connections water quality parameters, Jessica Tinko claimed “we know what is in the water a little bit more now.” The students would spend time interpreting all of their results and comparing stream health between their sites.

Dan Hudy was often surprised during the school year with the results of their monthly water testing. “The water is a lot cleaner than I thought it would be. I thought the phosphates would be higher but it was always cleaner. I did not expect it. The creeks always looked more polluted, but mainly they are healthy.” For the watershed snapshot, the Parker students tested streams they normally do not visit, including Whipple Run, downstream of the sewage treatment facility. Maybe they would find streams that were more polluted than others.

The results, seen below in the data table, varied from stream to stream and some numbers were a little puzzling and higher than others. For the second year in a row, Whipple run had the highest TDS reading, but the nutrient levels were low and the alkalinity/pH levels were normal. The Parker students would have to figure out what else might be dissolved in the water, elevating the reading. Other creeks had high phosphate results: 0.173 mg/L for Conneautee Creek at Crane Rd., 0.085 mg/L for Shenango Creek North, and 0.073 mg/L for Shenango Creek South. Although these results were lower than the Environmental Protection Agency standard of 1 mg/L, as little as 0.03 mg/L can result in excessive algal/plant growth. So if these results persist, they could cause problems in the creeks later in the warmer spring season.

At the end of the morning, the data table on the dry erase board was filled in and the students walked away having experienced a unique scientific study. Mr. Wise walked away feeling a little sentimental because this sampling event concluded his last year doing Creek Connections water quality monitoring and was his last watershed snapshot with Parker students. Retiring at the end of the school year, Mr. Wise remarked, “Everything I have done this year has been bittersweet. I look forward to the future but realize it is the last time that I get to do these things.” Although the glassware and the meters have been put away for the last time, Mr. Wise and his students have one more Creek Connections adventure remaining as they prepare their research project results and their watershed snapshot data analysis for the Student Research Symposium on April 4.

<table>
<thead>
<tr>
<th>Sites</th>
<th>Temp. (°C)</th>
<th>pH</th>
<th>TDS (mg/L)</th>
<th>DO (mg/L)</th>
<th>Nitrate-N (mg/L)</th>
<th>PO₄ (mg/L)</th>
<th>Alkalinity (mg/L)</th>
<th>Turbidity (JTU)</th>
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<td>Shenango Creek North</td>
<td>-0.5</td>
<td>7.15</td>
<td>135</td>
<td>6</td>
<td>0.12</td>
<td>0.085</td>
<td>102</td>
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<tr>
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<td>265</td>
<td>7.5</td>
<td>0.05</td>
<td>0.073</td>
<td>76.5</td>
<td>15</td>
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<td>7.2</td>
<td>535</td>
<td>12</td>
<td>0</td>
<td>0.015</td>
<td>122.5</td>
<td>12.5</td>
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<td>120</td>
<td>9</td>
<td>0.2</td>
<td>0.0006</td>
<td>153</td>
<td>15</td>
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<tr>
<td>Darrow Run</td>
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<td>190</td>
<td>12</td>
<td>0.2</td>
<td>0</td>
<td>93.5</td>
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<td>145</td>
<td>13.5</td>
<td>0.35</td>
<td>0.173</td>
<td>110.5</td>
<td>15</td>
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<tr>
<td>Little Conneautee @ Rt 99</td>
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<td>8.4</td>
<td>100</td>
<td>10</td>
<td>0.4</td>
<td>0</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Conneautee @ Kinter Hill</td>
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<td>8.4</td>
<td>140</td>
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<td>0.04</td>
<td>0</td>
<td>65</td>
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<td>7.9</td>
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<td>0.31</td>
<td>0</td>
<td>x</td>
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At Conneaut Lake Jr./Sr. High School this year, much of the curriculum is focused on watersheds. So, in addition to their regular water monitoring duties, Creek Connections participants in Mrs. Jacobs’ classes are learning about the geologic history of Pennsylvania as exemplified by local features including Conneaut Lake and other waterways. They are studying evidence that glaciers moved through the area, forming Conneaut Lake. They have discovered that the glaciers transported rocks all the way from Canada to NW PA and left them behind when they melted! They also learned that glacial activity is also responsible for the moraines found in Moraine State Park in Butler County. Moraines are soil, rocks and debris that accumulate at the edges and underneath a glacier and are left behind when the glacier melts. Meadville residents should be thankful for glaciers, too, because much of the water for the city of Meadville comes from five wells that are tapped into an aquifer containing glacial melt! French Creek and the Upper Allegheny River have also been shaped by glacial activity. In fact, 15,000 years ago, these waterways were all separate and flowed in the opposite direction! Indeed, glaciers have shaped many of the watersheds and waterways in PA, maybe even your sampling site!

Also at Conneaut Lake Jr./Sr. High School, Mrs. Spellman’s 10th graders are having their first experiences with chemical testing. They are quickly becoming experts on water quality. Last semester, some of them studied the biology of a local waterway and had a blast doing so!

The weather has definitely made water quality monitoring interesting the last few months. Clymer Central High School writes that it has been “a bit of a challenge as well with finding open water” at the French Creek Preserve and that Clymer students have had to truck through knee-deep snow to do their chemical testing! This new sampling site, however, is working out fairly well because, unlike their previous site, Clymer students can get right down to the water to collect their samples at the French Creek Preserve. In addition to using the typical meters and Hach kits, students are also getting experience using sophisticated palm pilot probes that their teacher Mrs. Bemis obtained through a grant she wrote! To make sense of the data they’re collecting, Clymer students are studying the different things that affect or are affected by the creek, such as mammals, birds, and weather. This year, Clymer students are also compiling their experiences and information into an Environmental Science Binder to be used by future classes and to show off at this year’s Symposium. Be sure to check it out at the Symposium!

Want to see your school highlighted in “Creek to Creek?” Email your school’s updates, activities and photos to creek@allegheny.edu!

Feature Creature

As an adult, I range from 4 to 7 ½ inches in length. My coloring can vary from reddish or yellowish brown to a light orange or salmon color. I have a very clouded or mottled appearance. My underside is a lighter color, and I usually have black spots around my throat area. You can identify me by a black line that runs from my eye to my nostril.

I can be found as far north as southern Maine, and as far south as Alabama. If you come searching for me, you should look in areas where water bubbles up from underground (groundwater) to the surface, along high velocity streams, and in wet caves. I like cool, well shaded, wet areas, such as beneath logs, stones or leaves. I prefer to live in these habitats. Also, you’ll have a better chance of finding me if you go looking at night because I’m partially nocturnal. I like to eat many different types of macroinvertebrates. Some times I will eat a frog or even a member of my own species. I have my first experiences with chemical testing. They are quickly becoming experts on water quality. Last semester, some of them studied the biology of a local waterway and had a blast doing so!

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- continued on pg. 7

Source: http://audubon.wku.edu/daviess/nspring.html

by Mary Zoller, Allegheny student
School Updates - continued from pg. 6

Even one of the snowiest Pittsburgh winters in recent memory hasn’t stopped Mr. Vogler’s Moon Area High School classes’ from connecting with their creeks! Their sites are not completely frozen so they continue to do chemical testing of their waterways. They have even done several kick net studies in the frigid water! Despite contamination of Montour Run by deicing material from the nearby airport and chloride from the roads, they’ve still found many leeches, scuds, and small fish. A few warnings from the Moon Area students to their fellow Creek Connections participants: Do not kick at the ice with waders! The ice inevitably wins the battle, slicing through the waders, leaving the student wearing them with icy cold, soaked feet! Also, do not test the thickness of ice by walking on it! Taking a swim this time of year is very unpleasant and dangerous, potentially leading to hypothermia!

West Mifflin Area High School students in Ms. O’Lare’s classes have also done biological testing at their site. However, instead of using kick nets they used leaf packs. The leaf packs pulled out of the creek in the morning only yielded five bugs, but the afternoon classes found a bunch of insects! Students got up-close and personal with these macroinvertebrates using Brock microscopes and magnifying “bug boxes” and identified scuds, crane fly larvae, aquatic sowbugs, and assorted aquatic worms. Most of the critters fell into the “Somewhat Sensitive” and “Pollution Tolerant” categories of the Pollution Tolerance Index. Perhaps the next step for West Mifflin students is to investigate potential sources of pollution in their creek. Do you know what might be polluting your local waterways?

Back in Pittsburgh, an oft-heard question at Perry Traditional Academy this year has been “Are we going to the creek today?” Teacher Ms. Wright wrote, “This year is Perry Traditional Academy’s first year with Creek Connections. Two ninth grade biology classes are testing the Wissahickon Creek in Riverview Park, Pittsburgh. The creek is a short ten-minute walk from the high school (and a longer twenty minute walk uphill back to the high school.) Students report that “it’s fun going to the creek...that they like looking for bugs...and that they like the hands-on experiments.” The next few months will see students continuing to sample, attending the Symposium, participating in an Interactive Reptile and Amphibian Program, and exploring Pittsburgh’s three rivers on the Pittsburgh Voyager. Throughout the year, these Perry students and their teacher have deeply appreciated Creek Connections extraordinary attention to detail from test kits and teacher workshops to Laura Branby’s help the days Perry samples. For both students and teachers, the Creek Connections Symposium promises to be a highlight of the year and a great starting place for next year.”

Joe Geyer, a student at Brashear High School in Pittsburgh, is also psyched about the Creek Connections experience. He wrote, “The Creek Connections program is a very good program that I enjoy very much. The program gets students out and hands on experiments. I’m from Brashear High School in Pittsburgh and we test Squaw Run creek. This creek runs into the Allegheny River right next to our water supply at Water works. (Pittsburgh Water Company). It really interests me because I want to know what’s in our drinking water. We usually try to go once a month. When we go we test for pH, nitrate, phosphate, temperature, flow rate, etc. It’s really cool because we students get to see what’s in the creek and how much is in there. We also get to learn how to test the water. Mr. Miller brings big boots and lets us get into the water with nets and catch different creatures. We have caught a lot of wildlife. We caught many different minnows, darters, crayfish and 3 kinds of salamanders. We use books to try to identify them. We bring a few back to the classroom to identify. Mr. Miller has a fish tank where we keep them. I really like Creek Connections. I learn a lot from the program. And I hope to learn a lot more.”

Testing Tips

by Jackie Stallard, Allegheny student

Many of our testing parameters require the addition of chemicals for various reasons. These chemicals are found in “Powder Pillow Packets” that all Creek Connections participants should be familiar with by now. It is essential that these chemicals be administered correctly to obtain the most accurate results. To ensure correct results, remember to be careful when opening the packets by abiding by the following rules:

1. **Always use scissors or nail clippers to open the chemical powder pillow packets.** One of these two objects will always be found in the test kit. Avoid using your teeth to open the packets at all costs! Although none of the chemicals are gravely dangerous, some can be harmful if ingested.

2. **Be conscious not to shove your fingers or nails into the packet to pry it open.** The residue found on your hands can alter the chemicals and have an unwanted effect on your results. Also, if you accidentally put your chemical-laden fingers or nails in your mouth, you risk ingesting the harmful chemicals. To avoid both of these problems, after cutting open the powder pillow with nail clippers or scissors, simply hold the pillow packet between your index finger and thumb of both hands, one on each side near the opening on top, and push the ends together. (See photo at right). This will easily force the pillow packet to open without altering the chemicals within and without getting the chemicals on your fingers. Always wash your hands after chemical testing!

3. **After using the chemicals for testing purposes, make sure the garbage is disposed of properly.** Be careful to place the empty pillow packets into a waste bin if you are in the classroom or into a trash bag if you are out in the field. Do NOT simply throw the garbage on the ground after the test has been completed.
A Furry Surprise
by Letsche High School students

While conducting a routine water sampling, the Letsche students were treated to a rare sight around the Pittsburgh area. A muskrat was seen swimming across the stream. This sighting led to further research on this mammal.

The muskrat resembles a small beaver with a long, rat-like tail. They average about two to three pounds in weight. Muskrats are only found where unpolluted waters exist. Whether these rodents stay and form a colony depends on available food supply, water purity, and annual water levels. The animals’ diet consists mainly of plants, but they also eat clams and any dead fauna found near their home. Females rarely breed their first year of life. The following year they can produce three litters consisting of six to eight young.

Although the teacher was able to properly identify the surprise visitor, the students were not impressed. “After all, a rat’s a rat.”

Sighting this rare muskrat while sampling at their Pine Creek site was indeed a “furry surprise” for Letsche students!

FEATURE CREATURE ANSWER
This issue’s Feature Creature (pg. 6) is a Northern Spring Salamander (Gyrinophilus porphyriticus).