As the days grow shorter and the temperatures begin to drop, we as humans begin to prepare for winter by digging out our sweaters, unpacking extra blankets, and turning up the thermostats in our homes a few degrees. Deer grow a thick coat of fur, squirrels furiously pack away caches of acorns, and hibernating animals find a cozy spot to sleep away the winter. But what happens to the six-legged ectotherms among us?

Fortunately, the insect world boasts a multitude of adaptations to cope with extreme winter weather. Perhaps the most well-known method of winter survival is some insects’ production of glycerol. Glycerol, a type of sugar, lowers the freezing temperature of body fluids and helps prevent cell damage from the formation of ice crystals. When kept in a dry environment, these super-cooled insects can survive temperatures of nearly –4°F!

Many insect species also pass the winter in diapause, or a long-term state of suspension. Praying mantis eggs, wooly bear caterpillars, black swallowtail pupae, and even some adult mosquito females employ this method of survival. The insect prepares for the extended dormancy by building up lipids, proteins, and carbohydrates in its system in order to maintain the body’s lowered metabolic function. Diapause is terminated when an external signal such as day length or temperature indicates the environmental conditions are once again favorable to the insect.

A more unique method of winter survival is exercised by gall-forming wasps, flies, beetles and moths. Typically, in the spring an egg is laid on the surface of the stem or leaf of the plant. Once the egg hatches, the larva burrows into the plant and secretes a chemical that irritates the plant causing excessive cell growth. This extra plant tissue conveniently forms an insulated shelter exclusively for the larva which will over-winter in the gall and hatch in the spring.

Possibly the most impressive display of winter adaptation is the yearly migration of monarch butterflies to Mexico and some parts of Southern California. Incredibly, monarchs over-winter in the same trees year after year even though no butterflies ever live long enough to migrate twice. The adults fly back north in the spring and lay their eggs, only to die a few days later.

Whether migrating, gall forming, freeze resistant, or suspended in diapause, insects are undeniably well adapted to weathering the extremes of the winter season. The next time you head inside to escape the cold, take a minute to appreciate the incredible winter adaptations of some of the smallest creatures on earth.

The Colbert Report

What do the following schools have in common:

Beaupre, Johnson, O'Donnell, Elmwood, Scott, Bartlett, Ender Salk, Francis Parker, Hauser, Highland, Thomas, and Leland?

These are schools that came to Taft during the 1980-1981 school year and are still on the 2009-2010 calendar. The significance is that the Taft Food Administrator, Andy Colbert, began working at Taft in 1980 and will retire January of 2010.

“One of the most enriching components of this job is getting to know so many good people from the various schools,” Colbert said. “For those that have been coming every year, it’s truly remarkable. And don’t forget, we also have many other schools that have been here five, ten, and twenty years.”

Colbert came to Taft Campus as a 22-year old and was one of the first male graduates of NIU’s Nutrition, Dietics, and Food Science program. Later, he became certified as an Executive Chef by the American Culinary Society.

One of the reasons for the repeat business is the outstanding food service in the Taft Dining Hall. That reputation started with Colbert’s predecessor, Margaret Gatz, in 1954 and continues through today. “With such a high turnover in the food business, it is unheard of to have only two people in that position for 55 years” Taft Director, Dale Hoppe, said. “My hope is to find someone with similar longevity.”

Colbert has seen many changes in his 29 years at Taft, including eating habits and special dietary needs. “When I first started, we would sometimes serve casseroles for lunch. Today, kids would turn their nose up at something like that,” Colbert said. “Fast foods have definitely influenced eating habits.

Still, Lorado Taft harkens back to the era of homemade food. Potatoes are peeled by hand, biscuits are made from scratch and whole turkeys are roasted. “We are a labor-intensive operation and it is important to do as much cooking as possible with raw ingredients, not only as a cost-saving measure, but from a nutritional and flavor standpoint,” Colbert said. “Rarely do we do anything fancy, but I like to think we’re able to give the school groups a taste of good old fashioned food made with a lot of care and attention to detail.”

Over the past years, one of the biggest challenges facing the Taft kitchen has been planning and preparing meals for dinners with special diets. When Colbert started in 1980, food allergies were almost unheard of. “It’s interesting,” Colbert said. “Did people have allergies before and not realize it, or has something manifested itself to cause so many people to be allergic to dairy, wheat and the like?”

What will Colbert miss the most about retiring from Lorado Taft?

“I think it is important in life to have a place to go to. For me, Taft Campus was that place, and as former professor, Don Hammerson, used to say, ‘Taft is a special place,’ Colbert said. ”To be honest, I wont miss the weekly grind of planning menus, ordering food, or supervising employees, but I will miss not being a part of something as special as Lorado Taft Campus.”

We’ll miss you Andy!
HAPPY RETIREMENT!
From The Taft Staff
**HOW DOES A COMPASS WORK?**

Have you ever been lost before? Or needed to find your way from one place to another? There are several ways to locate destinations. Maps have been relied on by humans for centuries to visually locate places and objects. GPS units are technologically complex and are an expansion on the simplicity of a compass. The compass has had great influence on the human race for historical reasons, as well as for simplicity.

The compass has a great history and was of importance even before we knew what it could do. In ancient China, humans first discovered the Earth’s magnetic field and used it as a means of entertainment. Magnetized arrows would point north and thus impress an audience. It is thought that the Earth’s magnetic field and these arrows were first used for direction in the 9th century. Slowly the use of a compass was transported throughout the eastern hemisphere. Until the compass became available around the globe, sailors navigated the open seas by watching the stars, the sun, the winds, the currents, and even by the migrating birds. With a compass, sea travel was made more safe and reliable for sailors. There is a rock called lodestone (or magnetite) with which ancient peoples used to rub a needle to make it magnetic. For this reason, sailors would carry a piece of lodestone on ship with them to keep a needle magnetic.

You may be wondering how exactly this magnetic compass works? The Earth has 2 magnetic poles (North and South). The magnetic field of the Earth causes a magnetic needle to swing into a North-South position when floating in water or hanging from a string.

You can even make a compass on your own! All you need is a sewing needle, a small bar magnet (or a refrigerator magnet or a piece of silk), a small piece of cork, and a small glass of water to float the cork and needle. To make your needle magnetic, take it in your hand with the point end pointing away from you. Take the magnet, or silk and stroke the needle from eye to point about 50-100 times. At this time you can either stick the needle in the cork from one end of the circle to the other (not through the exact middle), or rub the needle in your hair to coat it with a layer of oil. Next, float the needle in the cup of water and watch what happens. The needle point will indicate a North direction. Now you are all set to find your way!


---

**Get Inspired!**

Exercise your poetry talent this winter season! You may wish to warm up with a *cinquain* or *haiku* poem. Follow these formats and enjoy our examples of winter feeling and dreaming:

**A cinquain** (five line poem) follows the format:
- Two-syllable title
- Four-syllable description of title
- Six-syllable action
- Eight-syllable expression of feeling
- Two-syllable word picture for title

**Winter**
- Shivery, white
- Play, run, hike to keep warm
- Red, drippy nose and cold, numb toes
- Beauty

**Otter**
- Playful, hungry
- Diving and dining fun
- Anxious for bright, warm summer sun
- Busy

**A haiku** follows the format:
- Five syllables
- Seven syllables
- Five syllables

**Blustery whirlwind**
- Caught in an open snow globe
- Going up and up

---

Zero Food Waste Hall Of Fame!

Everyone who comes to Lorado Taft works hard to reduce their food waste. We would like to acknowledge those schools who reached the promised land of zero ort in the past semester:

- Latin School of Chicago
- Chicago City Day
- Beaufre Elementary
- Genoa-Kingston Middle School: Session 1
- Bardwell Elementary
- Galena Middle School (5 meals in a row!!)

Congratulations and keep working towards zero ort!

Wildlife Watching Fall-Winter Record (August 1–January 31):

- Gray Tree Frog
- Leopard Frog
- Turkey Vulture
- American Goldfinch
- Blue Jay
- White-tailed Deer
- Monarch Butterfly
- Dark-eyed Junco
- Mourning Dove
- Screech Owl
- Common Raccoon
- Cicada
- Bald Eagle
- Red-bellied Woodpecker
- Tufted Titmouse
- American Toad
- Deer Mushroom
- Hairy Woodpecker
- White-breasted Nuthatch
- Black-capped Chickadee
- Gray Squirrel
- Wild Turkey
- Vole
- Northern Cardinal
- Field Mouse
- Red Fox
- Jack-o-Lantern Mushroom
- Belted Kingfisher
- Northern Cardinal

Teacher Tidbits:

- Grant funding from IDNR -
  If you are looking for additional money to help fund your class’ visit to Taft, the Illinois Department of Natural Resources offers an Illinois Biodiversity Field Trip Grant. Unfortunately, the deadline has already passed for this year, but it is something to think about for the future. The Environmental Education Association of Illinois also has a mini-grant program that could help supplement some of the funding. If you’d like more information about these opportunities, contact Melanie at melcostello@niu.edu.

- New class activities -
  This past fall we moved our worms into two new vermicomposting bins and are also adding several new winter tracking activities. Please let your coordinator know if you would like these lessons incorporated into your ecology classes.

Taft Times Contributors

Autumn Foutch, Hannah Lavold;
Sr. Education Program Specialists

Laura Ritenour, Kim Tranel;
Education Program Specialists