

Litzsinger Road Ecology Center

COMMUNITY NEWSLETTER

www.litzsinger.org

in this issue

- 2 Today's Lesson: Mud, Mud, Mud
- 3 What is ECO-ACT?
- 6 Glass House Quiz: Fall Leaves
- 8 Fall Florals
- 9 Breaking News...
- 9 LREC Announcements
- 9 Local Events

October 2012

Stop Thinking, Start Creating!

by Bob Coulter

One of the classic ways of distinguishing us from other animals is to recognize our ability to think and reason: we are *Homo sapiens*, or “man the thinker.” Consistent with that image, I’ll ask you to...well, think about it. Does just being a “thinker” limit what we can do?

Harvard psychologist Ellen Langer conducted a fascinating experiment in which test subjects read a standard eye chart with mixed results, and then were put in the role of pilots in a test flight simulator. When embedded in a semi-real context, the same people were able to discern patterns that they had trouble with on the eye chart. Simply changing the participants’ identities extended their capacities.

What capacities are you extending as you move the kids out of the classroom and into the community? Supporting kids’ thinking is, of course, critical...but so is the nature of what they are thinking about. Your real-world projects help to give kids the space to do much more than they can in an academic task. Perhaps we should replace *Homo sapiens* with the image of *Homo faber*, or “man the creator.” Happy building! ✨

Students at Brentwood Early Childhood Center lead an excavation. See page 2. Photo by Eddie Jones.



Today's Lesson: Mud, Mud, Mud

by Eddie Jones

What does effective outdoor place-based education look like? At the Brentwood Early Childhood Center it looks like this:

- Schoolyard Habitat: 1000 square feet of soil carved out of a massive warehouse parking lot
- Curriculum Integration: architecture
- Community Partnerships: parents and a local business

Children exit the classroom into the schoolyard garden/habitat, grab their shovels and wagon, fill a couple of pails of water, and begin digging in the mud. The teacher has followed the children's interest in wet dirt and incorporated the activity into an architecture unit of study that is developmentally



This student is part of the "excavation" crew.
Photo by Eddie Jones.

appropriate for four-year-olds. The digging becomes an excavation, while other materials, both in and out of the classroom, are utilized to design and build structures. According to the teacher, they will wrap up this unit when the children grow weary of the mud (that may be a while) and direct their energy elsewhere. In the meantime, the students are seeking shade from the scorching sun, which has brought a couple of parents and a local hardware supplier into the picture with visions of a pagoda over a portion of the excavation site.

For outdoor place-based education to be effective, there must be a kid-friendly outdoor space available (a schoolyard habitat), student activity must support learning goals (curriculum integration), and the school family and neighborhood must benefit from and support the student activity (community partnerships).

Effective Outdoor Place-based Education

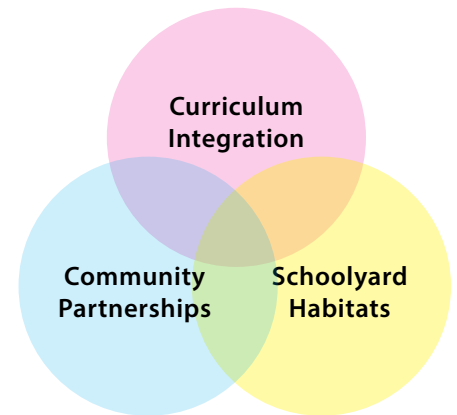


Diagram adapted from Maryland Association for Environmental and Effective Outdoor Education (<http://www.maeoe.org/habitat/qualities/>).

A fifth-grade architecture unit or a sixth-grade geography unit or a third grade literature unit, etc may look a little different.

The three components of effective outdoor place-based education are already present in schools. All that is needed is to weave them together for the benefit—and enjoyment—of the students and the surrounding school community. ✨

Brentwood Early Childhood Center

School District: Brentwood

Location: 1201 Hanley Industrial Court

Web site: <http://www.brentwood.k12.mo.us/ecc/>

Number of Classrooms: 5

Classes partnering with LREC: 2



ECO-ACT participants from Nerinx Hall instruct Clark Elementary fourth graders on the deck at Litzinger Road Ecology Center.

What is ECO-ACT?

by Leslie Memula

If you've looked at LREC's online calendar recently, you've probably noticed a handful of dates reserved for a Missouri Botanical Garden program known as ECO-ACT. ECO-ACT—which stands for ecology in action—is an environmental leadership program for high school juniors and seniors. I asked Meg Hoester, the Garden's Supervisor of Student Programs (including ECO-ACT) for more details about this unique program.

Can you explain what ECO-ACT is all about?

Sure! ECO-ACT is an opportunity for high school students to take a whole different kind of science class. Students receive science elective credit and have a hands-on way to learn about

ecology and environmental science, explore the outdoors, and teach younger students. Through ECO-ACT, high school students learn through teaching elementary students about ecology and environmental science as well as through conducting their own research project on a local environmental issue. They become leaders in the classroom and at their schools as they learn about the environment and design an action project. Through summer canoe trips, weekend adventure outings, and field trips to LREC, high school students explore the natural environment and challenge their comfort zones.

Which high schools are represented in your program?

School partnerships change a bit every year. This year Crossroads College Preparatory, Gateway High (St. Louis Public Schools), Nerinx Hall, St. Mary's, and St. Elizabeth Academy are our partners. There are a total of 24 high school students in the program this year.

Which elementary schools and grade levels are involved?

ECO-ACT usually works in the fourth grade since the science grade level expectations (GLEs) in Missouri are most aligned with ecology and our curriculum at that level. Our elementary partners include Washington Montessori and Mullanphy in the St. Louis Public School District, Clark

See **ECO-ACT**, page 4



From **ECO-ACT**, page 3

Elementary in the Webster Groves Public School District, and two Catholic schools: St. Margaret of Scotland and Immaculate Heart of Mary.

What are the different components of the ECO-ACT program?

The year begins with a summer component during which students attend three weeks of training that prepare them for the year ahead:

- Week one centers on exploring an urban environmental issue and presenting research findings at the end of the week—this week also includes an overnight in the Japanese Garden and several team challenge activities.
- Week two is a canoe trip on the Meramec River during which students learn outdoor camping and canoeing skills and focus on ecology.
- Teaching is the focus of the third week of summer as students become familiar with the ECO-ACT curriculum.

During the school year, students continue their focus on increasing their understanding of local environmental issues, teaching, and outdoor exploration. In teams, they research an issue impacting the local environment, presenting their research and designing an action project to address the issue.

Throughout the year, teams of two to three high school students are paired with a nearby elementary classroom where they teach ecology and conservation lessons once a week.

Finally, students attend a weekend overnight outing once each semester where they explore new activities and regions. Outings may include rock climbing or horseback riding in southern Illinois, a race-style scavenger hunt at the Shaw Nature Reserve, or biking the Katy Trail.

Why do you use LREC as a field trip destination and what happens during these trips?

As part of their teaching component, high school students lead their elementary class on a field trip to LREC once each semester where everyone gets to observe many of the concepts they've been

learning about in real life!

LREC is a great location for many reasons: it is located in St. Louis County making travel time easy for schools, the smaller size of the center aids the high school students in facilitating the trip—they can navigate without getting too lost—and the examples of the prairie, forest, and creek ecosystems provide a wealth of learning opportunities that tie to fourth-grade science standards.

Our fall field trip usually focuses on the characteristics of the prairie and forest (similarities and differences). We observe any interactions we can and talk about living and non-living factors. In addition, we often talk about seed adaptations in the prairie and soil components and decomposition in the

See **ECO-ACT**, page 5



A Nerinx Hall ECO-ACT participant leads a small group of Clark Elementary students as part of their LREC field trip.

From **ECO-ACT**, page 4

forest. This year we'll focus on the layers of soil in the riparian area at the creek, and students will make their own soil filter and talk about the benefits of riparian zones. For the second semester field trips, we plan to return in February and focus on watersheds.

Can you tell us a little bit about the Garden staff members who work with the ECO-ACT program?

ECO-ACT has a staff team of three:

I am the current supervisor and have been with the program for almost seven years. I have learned a lot on the job! Before coming to the Garden, I served with Ameri-Corps St. Louis in education and worked for Outward Bound. I'm also a yoga instructor and I love hiking.

Kelsey Vollmer taught high school biology in small-town Mississippi through Teach for America for two years before joining the Garden in 2011. Kelsey conducts monthly trail runs at the Shaw Nature Reserve and enjoys backpacking.

Eric Swanson joined the team in 2012. Most recently from Georgia, Eric has worked at several 4-H residential centers. He has two pet snakes and might someday study invasive boa constrictors and pythons in Florida.



A Nerinx Hall ECO-ACT participant explores Deer Creek with Clark Elementary fourth graders.

How can a high school student or teacher get more information on becoming involved with ECO-ACT?

Though I often get requests from elementary schools that would like to join the program, first I need a high school partner in the area of that school. I'm always looking for new high schools to partner with! General information about ECO-ACT can be found under Student Opportunities in the Learn and Discover tab on the Garden's website or use the URL: <http://www.missouribotanicalgarden.org/learn-discover/students-teachers/student-opportunities/eco-act.aspx>.

Any teachers and students can contact me:

Meg Hoester
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at 314-577-0241 📞

AUTUMN

by Martha M. Schermann

**Amazing
Unbelievable
Turning
Unique
Magnificent
Noticeable
Autumn Leaves**



Glass House Quiz: Fall Leaves

by Deanna English and Danelle Haake

Many folks are wondering if the drought will affect the leaf color this fall. For Deanna, the standard answer has been a shrug of the shoulders and the answer, “Well, I can guarantee that at some point they will get brown, shrivel up, and fall to the ground. What happens as far as color in between, I have no clue.” Danelle suspects that we will not have the most brilliant display of the century. But in the end, we both agree on one thing: we have NO CLUE. So, for this month’s quiz we thought we would do a little research, go to some experts, and learn along with you. We hope that you learn as much as we did!



A dogwood shows off its autumn colors in fall 2011. Photo by Danelle Haake.

- 1. What *triggers* the leaves on deciduous trees to change color?**
 - a) frost on the pumpkin means changing leaves—it’s the cold
 - b) shorter days—it’s the amount of light
 - c) it’s both temperature and light
 - d) the amount of rainfall—those plants can’t get nutrients without rain
 - e) all of the above
- 2. What causes the *different colors* to appear in the leaves?**
 - a) decomposition of the outer leaf tissue
 - b) pigments within the leaf
 - c) chemicals in the sap of the tree
 - d) the shape of the leaf
- 3. Now the question you’ve all been waiting for: what determines how bright and vibrant the leaf colors are in the fall?**
 - a) a wet spring
 - b) a cool and rainy summer
 - c) clear sunny days and cool nights in early fall
 - d) a hot and dry summer
 - e) cloudy and wet days in early fall
- 4. At the end of all that color, what makes the leaves fall to the ground?**
 - a) wind blows the dead leaves off
 - b) the tree forms cells that push them off
 - c) they just shrivel up and fall off
 - d) new buds form and push them off

See **Quiz**, page 7



From **Quiz**, page 6

Answers:

1. **b) shorter days—it’s the amount of light.** While temperature and rainfall have a lot to do with how the leaves change, the most important factor in the timing of it is the shortening of the days. That is why trees of a single species at the same latitude (and therefore with the same day length) will turn at the same time, whether on a cool, dry mountaintop or in a warm, moist valley.

2. **b) pigments within the leaf.** There are three pigments found in leaves: chlorophyll, carotenoids, and anthocyanins.

Chlorophyll is the most important because it allows the plant to convert sunlight to sugars for food. This is the **green** color we see on leaves. Chlorophyll is continually being produced and broken down during the growing season, but as the season ends and no new chlorophyll is produced, the

green pigment slowly fades, allowing other pigments and colors to show through.

Carotenoids are also made throughout the growing season, but are not broken down as swiftly as chlorophyll, allowing their **yellow, orange, and brown** colors to show through after the green has faded. These pigments also give color to carrots, corn, and bananas.

Anthocyanins are the **red** pigments and are produced during the fall in response to bright sunlight. The same stuff is found in red apples, strawberries, plums, and other fruits.

3. **c) clear sunny days and cool nights in early fall.** Both Chip Tynan at the Missouri Botanical Garden’s Kemper Center and James Trager at the Shaw Nature Reserve had similar responses. Quoting directly from an email response sent by Chip Tynan, “lots of bright sunny days accompanied by

cool frost-free nights in the weeks immediately preceding leaf drop is nature’s ace-in-the-hole for turning on late, vibrant colors. It doesn’t happen every year locally, though. On the other hand, a spell of cloudy days and above normal temperatures prior to abscission [the separation of the leaf from the tree] produces below average coloration. Just the same, there’s always at least some color, even if it’s just brown, right?”

4. **b) the tree forms cells that push them off.** As the days grow shorter and cooler, a hormone in the tree sends a chemical message to the leaves that basically is saying, “Get off me!” To do that, the tree produces little cells along the leaf stem where it meets the branch. The cells are called “abscission” cells. They are basically scissors that slowly cut the leaf away from the branch. For those of you that answered a, the wind does help to finish the cut.

Sources:

Trager, James. Shaw Nature Reserve. (Email communication 9/21/12.)

Tynan, Chip. Missouri Botanical Garden. (Email communication 9/21/12.)



Edge of north prairie in fall 2011. Photo by Danelle Haake.

See **Quiz**, page 9

Fall Florals

by Danelle Haake

When we look into the prairies at this time of year, we are greeted by a sea of yellow and gold. Our most prolific bloomers at the end of September have been goldenrod, sneezeweed, primrose, and wingstem with a few straggling sunflowers, rosinweed, and prairie dock. But do not overlook some of our favorite, low-growing prairie flowers. The vivid blue of the closed gentian (*Gentiana andrewsii*) now dots all three of our prairies. It is thrilling to have finally established colonies of this highly sensitive plant!

In recent weeks, we have come across two white-blooming plants that took our breath away. First, we found ghostly white flowers of closed gentian; this is the same species as the blue, but a different variety. Then, during our plant monitoring, we found an orchid previously not recorded on-site: nodding ladies' tresses (*Spiranthes cernua*). Found in the eastern half of the U.S., it is relatively common for an orchid, but that did not dampen our excitement at the find. ✂



1: Blue variety of closed gentian.
2: White variety of closed gentian.
3-5: Nodding ladies' tresses.
Photos by Danelle Haake.

BREAKING NEWS...

We just got news that the National Science Foundation awarded us a new grant to support a project we have been working on for the past couple of years. Some of the older elementary classes have been using smartphones to solve environmental mysteries. Imagine being guided by the GPS tools in the phone to observe certain locations and link clues



Deanna English works with a student using a handheld at Litzsinger.

found on the grounds and on the phone. We also ran a camp this summer with kids designing their own handheld games.

With the new NSF grant, we'll continue our partnership with MIT on developing the tools, and work with colleagues at the San Diego Zoo, Columbus (Ohio) Zoo and Aquarium, and the Red Butte Botanical Garden in Salt Lake City to develop new games. Look for updates as the project unfolds. ✂

From Quiz, page 7

USDA Forest Service. "Why Leaves Change Color." <http://www.na.fs.fed.us/fhp/pubs/leaves/leaves.shtm>. Web 21 September 2012.

"Why Leaves Really Fall Off Trees." *All Things Considered*. National Public Radio. 30 October 2009. <http://www.npr.org/templates/transcript/transcript.php?storyId=114288700>. Web 21 September 2012. Transcript. ✂

Fungal Jungle

In the past we've been fortunate to have Larry Evans (brother of volunteer Don Evans) lead mushroom forays at LREC as part of our Volunteer Enrichment program.

This fall and winter he's heading farther afield, leading mycological adventures in Argentina and Bolivia.

Learn more at <http://www.fungaljungle.org>.

LREC Announcements

October 3 & 31

Monthly Water Quality Sampling

9am to noon, meet at the Glass House. October 3 date is a make-up date for September. Costumes optional on October 31! Questions? Contact Danelle Haake at danelle@litzsinger.org or 314-961-4410.

October 4

Macroinvertebrate Sampling

Meet us 12:30pm in the Glass House if you need boots, or 1pm by the mulch pile if you don't. Questions? Contact Danelle Haake at danelle@litzsinger.org or 314-961-4410.

Local Events

October 1-31

October Owls and Orchids

At the Butterfly House (daily with extended hours from 4 to 7 p.m. on Tuesdays). Witness more than ten times the normal number of owl butterflies and an impressive display of orchids. Included with regular admission. Learn more at <http://www.butterflyhouse.org/>.

Through October 31

Plastic Pot Recycling

9am to 5pm daily at the Garden's Monsanto Center. Recycle your plastic garden pots, polystyrene cell packs, and trays. Details at <http://www.mobot.org/plasticpotrecycling/>.

October 13

The Great Shaw Scavenger Hunt

9am to 6pm at the Shaw Nature Reserve. Form a team of up to 5 members and compete against other teams to finish a series of questions and tasks. A spaghetti picnic dinner will follow. \$45 per team. Advance registration required. More at <http://www.shawnature.org/>.