



The ALMANAC

A newsletter of Wolf Ridge Environmental Learning Center

February 2017 Volume 46 Number 1

PETALS OPENED: LIVING BUILDING CHALLENGE

by Lori Walewski, Wolf Ridge Naturalist

“Wow,” gasps a graduate student naturalist as she takes in the view through the newly installed window in the future naturalist house. The forest stretches out before them and meets up with Lake Superior, which in turn reaches out and blends into the sky. The view speaks of dreams and possibilities. Over 40 years ago,

Jack Pichotta, a school teacher and Wolf Ridge’s founder, had an idea that began with wanting students to be immersed in a week of learning about Earth Day. That idea grew and blossomed into the Wolf Ridge of today. Most recently, that dream expanded to include a naturalist house, maintenance building, a newly renovated West Dorm and land on Lake Superior. The West Dorm will be renovated to be Living Building Challenge (LBC) certified with the

naturalist house serving as a prototype project for the West Dorm certification. We chose LBC because it embodies the Wolf Ridge mission. In past Almanac articles we have shared what the LBC is and included some stories about meeting this challenge. Today, let’s look deeper into the various elements of the LBC.

The LBC begins with the certification process. This consists of three steps. 1) Registration - Wolf Ridge registered the West Dorm renovation to the LBC ver-

sion 2.1 in September 2014. 2) Documentation and Operation - We are currently in this phase which includes construction and compiling documentation that our process meets the Imperatives (standards). Once the building is completed, 12 consecutive months of the building



performing to LBC standards must take place. This is followed by 3) Audit and Certification.

Let’s dive into the layers of LBC certification. First, every project belongs to a Living Transect category which helps to define “proper development in specific settings...and applies to several Imperatives throughout the LBC.” Wolf Ridge’s project is categorized as L1 - natural habitat preserve. Next, the project is assigned a Typology which defines the

kind of project. There are four typologies - neighborhood, building, landscape and infrastructure and renovation. The West Dorm falls in the renovation category.

Once the project is properly categorized it is matched up with the imperatives for that category. Each Petal has one or more Imperatives, or standards, that varies based on the Living Transect.

“Imagine a building designed and constructed to function as elegantly as a flower.” This is how the International Living Future Institute opens its handbook on the overview of the LBC. It is from the flower that we get the seven Petals or performance areas for the LBC: Site, Water, Energy, Health, Materials, Equity, and Beauty. There are 20 Imperatives. As a renovation Typology,

Wolf Ridge’s West Dorm project must meet 15 Imperatives to get full certification. Let’s now take a look at the petals and the Imperatives that apply to our project.

SITE: The intent of this petal is to stop growth on virgin lands and/or restore or reuse already disturbed areas. We must meet 2 of the 4 Imperatives as a renovation Typology: 1) Limits to Growth - projects may only be constructed on previously developed sites and 2) Habit

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VIEW FROM THE RIDGE

by Peter Smerud, Executive Director



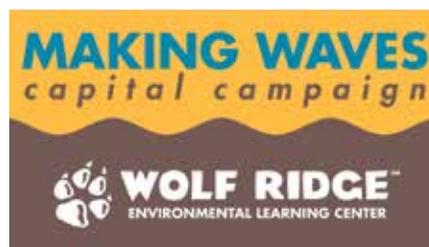
The joys of working at Wolf Ridge routinely come from the community of people who come together to make learning experiences occur here. Working the past couple years to set our Making Waves projects in motion I've met many people who care a great deal and want our future generation to be empowered and skilled to meet the changes ahead for humans and the environment. Perhaps my favorite interaction was a camp parent, Kate, and her daughter, Mackenzie. Kate reached out to me after she received an email about our need for help. She offered to approach her corporate employer, feeling that they may be interested in partnering on such a project and providing financial support. "I'd be very happy to dig deeper into the possibilities of my organization's ability to help out such an amazing organization." Mom's motivation to do so was based clearly on her daughter's experience at Wolf Ridge. Mackenzie had incredibly strong feelings about Wolf Ridge, stating to her mother that it is "my most favorite place on earth." The previous year Mackenzie had visited both Wolf Ridge and Disney World. When asked about her favorite trip of the year she exclaimed, "Wolf Ridge, hands down."

These stories come again and again. Every time I am humbled by all people Wolf Ridge reaches. I sit at restaurants in the Twin Cities and many times the server tells me their Wolf Ridge story or it is the young person at the check out counter at Trader Joes or the adult next to me as we wait in line at Target

Field that shares their Wolf Ridge experiences. They repeat the message shared by Mackenzie and her mother. The corporations, foundations, and individuals who are giving to our Making Waves campaign will create richer outdoor experiences for more and more people at Wolf Ridge, whether as a camper, school student, or adult learner. They will also enable future generations to behave in more sustainable ways.

The time is now. A \$250,000 matching gift was laid before us with the target date of March 1, such that when we reach \$6.45 million, we'll immediately jump to \$6.7 million with the match. We have gap financing in place, so what is needed are pledges, including multi-year. While the amount needed for the entire project remains at \$9.4 million, Phase 2 can be accomplished with a smaller amount of \$8.1 million.

Thank you to those who have joined us thus far in this campaign to improve Wolf Ridge. If you've been watching and considering participation the time to engage is now. If you've thought about a connection you have to a corporation or similar entity that may want join Wolf Ridge on this project the time is now. Please spread the word. The project will happen, it's now simply who will join the team that makes it so. ♦

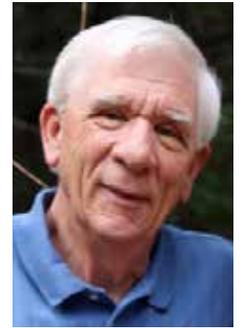


"Cutting edge facilities to teach our children to appreciate the value of nature have never been more important."

- Ruth and Dale Bachman,
Wolf Ridge Wave Makers.

FROM THE BOARD ROOM

by Russ Bierbaum, Board of Trustees Chair



It has been an exciting and challenging few months since I became Chair of the Wolf Ridge Board of Trustees in October 2016. I am following in the footsteps of Tom Berg who, left some very large shoes to fill but his leadership and hard work has had a very positive impact on the stability and operations of Wolf Ridge. We all owe Tom a big THANK YOU!

The exciting news is that we are well underway with Phase 1 of our capital project; construction of the first two buildings is scheduled to be completed in March. The Student Naturalist building is using the standards of the Living Building Challenge (LBC) as its basis for design and will house 24+ naturalists. The goal is a zero energy building. The maintenance staff will for the first time in the history of Wolf Ridge have a heated space to service our plow truck and other vehicles making this work

much more pleasant and efficient.

Our ongoing Making Waves capital campaign has raised \$5.5 million in donations and/or pledges from many people, foundations and corporations. Cash received to date allowed the Board of Trustees to approve Phase 1 of construction. The Board is truly grateful for the support of our donors! The challenge is that to complete Phase 2 we must raise nearly \$2.5 million more in donations and/or pledges. Phase 2 is critical to ensuring that Wolf Ridge continue to be a world leader in environmental education. The West Dorm will be totally gutted and renovated with a small addition. The goal is for the West Dorm to acquire LBC certification (one of a handful of such buildings in the US). The dorm will have interactive features that will be tremendous tools for teaching students about energy use and conservation. Phase II will also

include a small building project on 64 acres of leased land on the shore of Lake Superior. Having access to Lake Superior has been a dream of the staff and Board of Trustees for many years. Lake Superior offers unlimited potential for staff to teach students about the importance of water as a natural resource.

The Board of Trustees is committed to moving forward with Phase 2 construction in 2017. But, we need your help. Donations and/or pledges must make up the nearly \$2.5 million shortfall. We still need your help either as an individual donor or by identifying potential new donors. We do not want to delay Phase 2 I to 2018 and incur additional construction costs. Thanks for your support of Wolf Ridge. ♦

These Wave Makers have put the total raised as of mid-January at \$5,497,274!

\$1,000,000+

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Thank you for the outstanding commitment!

*In-kind donors

WOLF RIDGE NEWS BRIEFS

In November, a **new generator and blades** were placed on our wind tower. During the summer lightning struck our tower making the generator inoperable. The replacement generator is the latest generation of technology and the blades are longer than the previous ones. It is now cranking out nearly 30% more power than before.

- Wolf Ridge staff have been **providing leadership** at several conferences this fall. Shannon Walz, Joe Walewski, Luciana Ranelli, and Sarah Waddle road tripped down to Madison, WI for the NAAEE (North American Association for Environmental Education) conference. Joe presented on the student teacher program with Kevin Zak and Mary Beth Factor (former Wolf Ridgers now at Northland College in Ashland, WI and Trees for Tomorrow in Eagle River, WI) and Shannon and Dave Chase, Libby McCann, and Laura Andrews with Antioch University of New England presented on our graduate school partnership. This group also met up with 22 Wolf Ridge alumni that are working in the environmental education field across the U.S. Betsey Mead, Peter Harris, Elizabeth Williams, and Carrie Anderson attended the NSTA (National Science Teachers Association) in Minne-



apolis at the end of October. Wolf Ridge had a booth and had a great time making connections with area science teachers. Elizabeth staffed a Wolf Ridge booth at the MEA (Minnesota Educator Academy) and promoted Wolf Ridge programs. Wolf Ridge hosted the MNA (Minnesota Naturalist Association) conference with over 130 attending! The focus was food and farming in environmental education. Wolf Ridge farm manager, David Abazs showcased our organic farm and

curriculum. Several other Wolf Ridge staff presented and lead various sessions. The keynote speaker was Sean Sherman, the Sioux Chef and Oglala Lakota, who taught about indigenous foods.

- Numerous **staff changes** have taken place. Danielle Hefferan has joined the program team in the new position of curriculum and naturalist training coordinator. Erin Waldorf has a slight role change, becoming the group program and wildlife director. Colby Abazs served as the interim food service director. New hire, Christopher O'Brien is now the food service director. Zach Bates moved from the custodial to the food service department. Mike Sutherland joined the maintenance team, Brody Smith joined custodial staff, and Jesse Larson and Sandy Gunnick round out our food service department.

- All is well with the **education animals**. Tuuli (wind in Finnish) the kestrel is stepping up on the gloved hand as well as eating from the hand. Our bullsnake, Tigger is handling very well and is comfortable with students touching him. Korppi, our raven still has regular visits from wild ravens. Several staff have observed objects being passed between the ravens. ♦

Wolf Ridge...

One cold December day, Wolf Ridge received an e-mail from Jamar Company, one of our construction contractors.

"Today, while we were working on the metal roof on the new building, a group of kids walked by. They said thank you for what we were working on in the cold and so on! Just wanted to say to them, 'thanks for making our day.'"

~ the guys from Jamar Company



The new home for Wolf Ridge naturalists.

...Touching Lives

PROFILE: DANIELLE HEFFERAN



Danielle Hefferan recently joined the Wolf Ridge staff as the curriculum and naturalist training coordinator. This is a new position at Wolf Ridge. Danielle was a student in the Graduate Training program in 2013/14 and stayed on for a second year as a mentor naturalist. Following a passion for growing food and flowers, Danielle perused some farming experiences in Vermont, Texas, and Minnesota.

Tell our readers about something that you have learned as the result of your time or association with Wolf Ridge ELC. I believe through practicing observation and attention to our natural world here at Wolf Ridge, I have been able to fine-tune my sense of place and ability to pay attention to and understand those around me.

Please share a favorite Wolf Ridge memory. One frigid Wolf Ridge winter night, a couple naturalists and I went out to deliver hot cocoa to our lovely ropes course instructors. We were so delighted to see their happy faces receiving unexpected cocoa. After visiting the ropes courses, we got to talking about stars while walking along the trails and decided to go lie on Wolf Lake to star gaze. We shared star stories and enjoyed the silence. To this day, it is one of my core memories of my experience as a naturalist at Wolf Ridge.

Tell us about yourself. Dancing is maybe one of the most important outlets in my life - all kinds of dance. I am looking forward to signing up for a swing or salsa class this winter. Hobbies include napping in the sun, reading, hiking, watching good TV shows with friends, cooking, tending to my plants, talking to people, making things, splitting wood, and dancing. I hope to acquire a couple cats and a dog soon, but I did just inherit a beautiful poisonous plant so that may affect my decision to have live animals.

What book and/or movie would you recommend others read. Hmm, what book would I recommend? My memory usually only vividly keeps the current book I finished. So I would have to recommend that, which is *The Power of One* by Bryce Courtenay a South African novel. I enjoy books that teach lessons about people and philosophy through engaging drama and stories.

Please share a travel adventure. I biked up and down the Florida Keys once! A trip I highly recommend, even though I don't like hot places. It was beautiful and so different from what I am used to, physically and culturally.



What is your favorite place at Wolf Ridge and why? I love the dining hall. I look forward to everyday waiting in line for food with my peers and eating with everyone.

If you could visit with any conservationist/naturalist/environmentalist, living or dead, who would it be and what would you say. Jane Goodall. I would thank her for inspiring me to enter the realm of natural history and environmental science. I would ask her how her work and perspective has shaped how she interacts with her world. ♦

Exchange - an equal amount of land must be set aside in perpetuity. These Imperatives are straightforward and easy for Wolf Ridge to attain. Our project is a renovation not using any new land and we have land that we can set aside on our 2000 acres.

WATER: This Petal's goal is to have people respect water as a precious resource by re-thinking their water usage and what happens with one's wastewater. Wolf Ridge needs to meet the Net Zero Water Imperative for this Petal. This Imperative is a fairly easy one to meet for us while another LBC project in CA, with whom we have been conversing, is finding this Imperative very likely to be insurmountable. The Imperative demands a 100% closed loop system. We calculated the average rainfall for the building footprint and how much water will be used in the building per year. It turns out that the West Dorm footprint gathers more rain than the water used throughout the building so we actually are net positive for this Imperative! The waste water stays on site and is purified in our septic system without the use of chemicals fulfilling the closed loop system.

ENERGY: The objective for the petal is to produce energy for the project by using renewable energy in a pollution free way. The only Imperative in this Petal is Net Zero Energy. This Petal is Wolf Ridge's biggest challenge given our extremely cold climate. Domestic water heating with solar is already proven at the East Dorm and will be installed to supply the West Dorm. While the power needs of the building will be easily met with photovoltaic panels, space heating is a challenge. The extreme cold of our climate combined with only a few feet of soil before you hit bedrock limits our options very quickly. Offsets are possible and options for the dorm are being investigated and discussed with LBC staff.

HEALTH: Here the intention is to create living spaces that boost mental and physical health. Three Imperatives need to be met: 1) Civilized Environment - Every occupied space needs windows that open and provide daylight. 2) Healthy Air - A. Entryways need to have acceptable methods

of externally and internally preventing dirt from being tracked in. B. All rooms with "vapors" require separate vents to the outside. C. Ventilations rates must comply with codes and CO2, temperature, and humidity must be monitored. D. Smoking is not allowed in the project boundary including during construction. 3) Biophilia - Design elements containing natural elements. Each of the six-biophilic design elements (environmental features, natural shapes and forms, natural patterns, light and space, placed-based relationships, and evolved human-nature relationships) must appear. For example, these elements might appear in carpet patterns, the fireplace, and tile colors.

LIVING BUILDING CHALLENGE SUMMARY MATRIX: WOLF RIDGE WEST DORM RENOVATION	
LIVING TRANSECT CATEGORY: L1	
TYPOLOGY: RENOVATION	
PETALS	IMPERATIVES
SITE	Limits to Growth Habitat Exchange <i>scale jumping</i>
WATER	Net Zero Water
ENERGY	Net Zero Energy <i>scale jumping</i>
HEALTH	Civilized Environment Healthy Air Biophilia
MATERIALS	Red list Embodied Carbon Footprint Responsible Industry Appropriate Sourcing Conservation + Reuse
EQUITY	Rights to Beauty
BEAUTY	Beauty + Spirit Inspiration + Education



MATERIALS: This Petal has 5 mandatory Imperatives. We will address this Petal by itself in a future article. One example is finding windows whose vinyl does not contain a Red Listed Chemical is a Materials challenge mentioned in previous articles in the Almanac.

EQUITY: The goal here is to create a sense of community for all regardless of abilities and socioeconomic class. Of the 3 Imperatives in Equity, Wolf Ridge is required to comply with Right to Nature. There are 3 items. A) Fresh Air - No noxious emissions. B) Sunlight - The project must not shade over an allotted amount of neighboring buildings. C) Natural Wa-

terways - The project cannot prevent the public access to water environments.

BEAUTY: The seventh Petal is beauty. The purpose is to create joy, which in turn leads to caring for the environment. It has 2 Imperatives - Beauty and Spirit ,and Inspiration and Education. The Imperative of Beauty and Spirit is simply to delight and celebrate life. The second Beauty Imperative is Inspiration and Education. This Imperative requires that Wolf Ridge educate others about the construction, operation, and performance of our LCB project and open it to the public at least one day per year.

The reality of Wolf Ridge of today which, blossomed from Jack Pichotta's dream has its origins in education. Here at Wolf Ridge, the first accredited environmental educational school in North America, education is always at the forefront of our minds. Education is what makes the Living Building Challenge certification process so exciting. We love learning about ways to keep our earth a healthy place. We love that the construction and manufacturing companies are learning better practices by participating in our project. We have already been educating you, our readers, with these articles. Our living building story is just beginning. We look forward to sharing this story as we learn more. Just as an educational week of Earth Day activities lead to the Wolf Ridge of today, we are convinced that the Living Building Challenge will help us learn and educate for better living of tomorrow.♦

Visit the
Making Waves update blog

<http://wolf-ridge.org/blog/>

on Tuesdays for more in-depth information on the Petals and Imperatives and examples of how we are using them in our project.

BD IN FROGS

by Julia Luger, Wolf Ridge Naturalist



Searching for frogs.

Scientists over the last 30 years have seen catastrophic declines and extinctions of over 200 different species of frogs all across the globe. Wolf Ridge has been concerned about these findings because it may be the greatest loss of biodiversity due to disease in all of recorded history. The disease at the heart of this issue is called chytridiomycosis and is caused by an infection of the fungus *Batrachochytrium dendrobatidis*, more commonly known as BD.

BD infections can be very deadly because it can cause an amphibian's skin to become much thicker than normal, a condition called hyperkeratosis. Frogs and other amphibians generally have thin, permeable skin that allows them to breathe and maintain the levels of electrolytes in their bodies. The thick skin caused by BD can lead to very low electrolyte levels and may lead to death.

Treatment for infected individuals is only possible in captivity. Scientists currently use antifungal medicines and elevated body temperatures to cure infected amphibians. More research is being done to determine other effective ways to rid or reduce the prevalence of the BD fungus in the natural environment.

BD has currently been found on every amphibian-containing continent. Lisa Tracy, a Biology professor at Inver Hills Community College has been working with her students to collect samples from amphibians in the metro area and test them to learn more about the prevalence there. Professor Tracy is currently on sabbatical on the North Shore and is planning to begin studying the prevalence of BD here.

This is where Wolf Ridge is getting involved. Although we are in the middle of winter, Wolf Ridge is working on incorporating this citizen science project into a class called "Frogs and Toads." This class has students exploring Wolf Ridge's many wetlands to find and identify different amphibians. Students in this class will be assisting Professor Tracy with collecting samples from different frogs and toads found during class. We will collect data such as species, location of capture, and weight of the amphibian in addition to swabbing that animal for BD. The swabbing process is relative-

ly simple, a non-cotton swab is rubbed over the ventral drink patches (an area that is particularly susceptible to BD), down the hind legs and feet a total of 30 times. This process will pick up any fungal cells present on the amphibian and can later be tested by Professor Tracy's students.

This research will help scientists get a better understanding of BD prevalence in northern Minnesota. Once we know if BD is present on the Wolf Ridge property, Professor Tracy and others can begin to test all along the North Shore to determine the health of the amphibian populations in our area. You can help stop the spread of BD by leaving amphibians in the same place they were found. BD can also spread through infected water so be sure to clean off equipment such as boots and nets when moving between water bodies. ♦



Swabbing an American Toad.

Betsey (Pichotta) Mead (90) and her team, Betsey's Boomers, consisting of **Erika LeMay (17)**, **Laura Prasek (10)** and friend, and **Jill (Johnson) Hansen (05)** won the Wolf Ridge bonspiel. **Mary (Callahan) Schreiber (01)** is working for Big Brothers Big Sisters. **Keith Mastin (96)** has been working at the Western North Carolina Nature Center in Asheville, NC as the education curator for the past 16 years. He got married a year ago in March. **Elise Haupt (00)** is working as a PA at Regions Hospital in St. Paul. **Amy Behrens (09)** joined the Wolf Ridge community living in Duluth in June. She is a speech pathologist. **Kati (Kristenson) (11)** and **David Stieler (11)** had a busy December. They moved to Grand Marais, MN where they are both working at Great Expectations School as paraprofessionals and baby boy Karsten joined the family. **Larissa Giebner (15)** and Sam are the proud parents of Anders, born in August. **Sarah Waddle (15)** is now employed at North House Folk School as the program manager working with emerging artisans, local engagement, and volunteer development. **Randall Walz**, Wolf Ridge store manager broke his leg over the holidays playing boot hockey. **MJ Bach (12)** has landed. She is teaching 6th grade science at Kennedy Community School in St. Joseph, MN. **Sonja Smerud (16)** is another new Duluth resident. She is working for the Lake County Soil and Water Conservation District as the aquatic invasive species coordinator. ♦



BRAINS & LEARNING

by Joe Walewski, Wolf Ridge Naturalist

We all learn and process differently as we age. You may have a seven year old, a teenager, or an adult in your life who simply confounds you. You know what I mean. Just last week a Wolf Ridge naturalist asked, “why are they being that way... and how can I motivate and manage 9th graders in my Birds class?”

We all teach. It can be very helpful to have a framework to better understand and respond to the varying needs of our students and other people in our lives. A brief look through the lens of neuroscience and cognitive science will give us that framework.

Let’s start with a bit of neuroscience. Brain development begins 4 weeks after conception. In the first four months of gestation over 200 billion neurons form and connections are already being made. A newborn’s primary learning is of the self. Body functions and movement are the primary lessons.

With young learners (to age 12), *experiences happen to them*. The child’s brain makes many more connections than an adult’s brain and at an incredible pace. The child absorbs everything in their environment and “windows of opportunity” are wide open for motor development, language acquisition, math/logic, music, and more. Rich learning environments are vital at this time. As the child approaches puberty, connections that the brain finds useful are made permanent. Other connections not actively used are pruned. Though this pruning continues throughout our lives, the most intense pruning happens before age 12. The motto here is use it or lose it!

Adolescent learners (ages 12 to 19) are the majority of learners who attend Wolf Ridge. *They don’t care how much you know until they know how much you care*. The teenage brain undergoes amazing structural and chemical changes. As the prefrontal cortex continues massive development, the emotional chemistry and limbic system undergo radical changes too. Serotonin levels drop and then increase in adulthood. Low levels of se-

rotonin have been connected to anxiety, depression, and hyper-responsivity to stressors. Dopamine levels increase, especially in the prefrontal cortex leading to increased risk-taking and poor decision-making. Cortisol levels spike during stressful situations. Cortisol puts the brain into survival mode and shifts the attention away from learning in order to deal with stress.



☁️ **“I should look for birds.”**

With adult learners (ages 20 and older), *experiences define who they are and how they think*. The prefrontal cortex is fully developed. These learners are much more capable of managing emotions. Previous experiences have influenced brain development. Brain architecture directly impacts how new experiences and predictions are processed. New connections still develop, but the rate of change is drastically reduced.

What can we infer from this? Humans can learn regardless of age. The brain’s biological mechanisms for learning are relatively the same regardless of developmental level, however effectiveness and efficiency changes over time and in predictable patterns.

Neuroscience is a very young science - we are learning new things daily about the structure and function of the nervous system, the brain, and the chemistry involved. Cognitive science, on the other hand, is much older. Closely related to psychology, cognitive science covers the mind

and mental processes such as thinking and learning.

This is the crux. Though thinking and learning are affected by the biology of the brain, they actually occur within the mind. The brain serves as a physical space where the mind resides. We might compare a brain to a computer (hardware). In this analogy, the programs/apps (software) running on the computer serve as the mind.

All of this brings us back to “why do they act that way and how can I affect their motivation to learn?”

Let’s consider a Wolf Ridge moment of learning, bird identification. It all begins with (1) the ability to consider looking for a bird. Once a learner directs their attention to this task, they are able to (2) receive necessary sensory input by seeing or hearing a bird. Certain aspects of the birding experience will be more intensely (3) noticed and remembered based upon specific emotions. The entire experience is then manipulated by the prefrontal cortex as the learner (4) invents (with influence from teacher and peers) a meaningful and plausible story. Eventually the story influences the learner’s (5) understandings, goals, and behaviors concerning birds in another setting.

Mapped on the Spiral Learning Model, we can see how thoughts might navigate and move through the mind within the brain’s structure. But as the mind processes our birding experience, how can we overlap some understanding of brain biology so as to best assist our learners at different stages in their lives?

Next is a working model - the Learning Needs Pyramid. From the bottom upward:

Explore Reality (perception phase). *Experiences happen to them*. Provide authentic experiences for young learners. Be sure that these experiences are rich in sensory opportunities. Role model how to be successful. Younger learners appre-

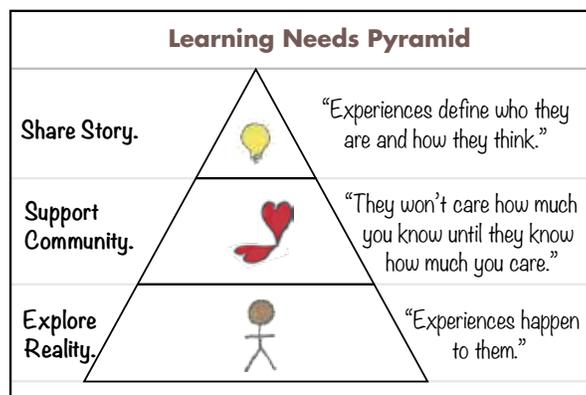
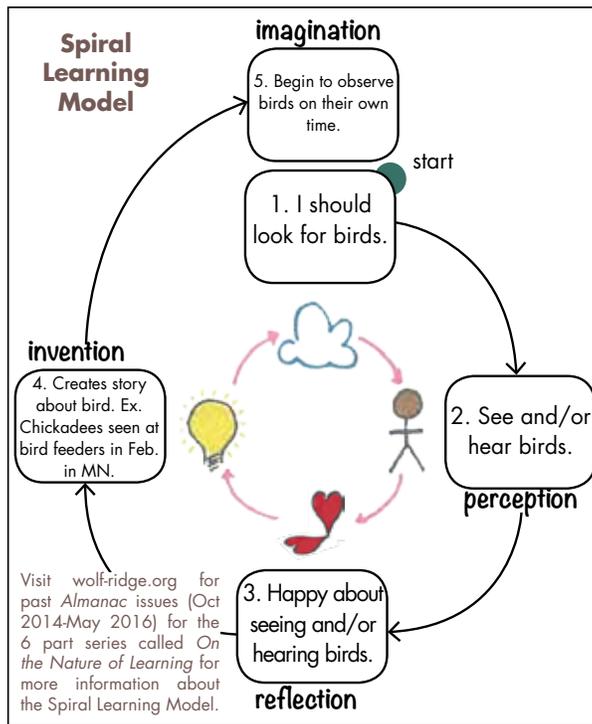
ciate the opportunity to use appropriate tools and to interact directly with the topic at hand - binoculars and live birds, for example.

Support Community (reflection phase). *They don't care how much you know until they know how much you care.* How learners FEEL about a situation may have more impact on attention and memory than how they THINK about it. Help them reflect on experiences and community connections. Teens appreciate moments of magic, beauty, and awe - a bird in the hand, for example.

Share Story (invention phase). *Experiences define who they are and how they think.* Create opportunities so that each learner is able to give and receive varied perspectives on their previous and current experiences. Adults appreciate sharing their stories and hearing other shared stories - about birding now and in other places, for example.

It's important to note that the Cloud (imagination phase) isn't missing; rather, as a focus on goals, it is present at all three learning levels and actually permeates the entire pyramid.

All learners process at each and every level. In our example, what learner would not appreciate interacting with binoculars and live birds, having a bird land in their



hand, and sharing their stories about the birding experience? Every level is vital.

Still, teachers should alter their curricu-

lum and educational efforts based upon each learner's developmental level. As with any pyramid, a solid base is essential. Start at the base and build upward. The base is constructed of real, authentic experiences. The next layer builds upward via social and emotional processing. It's only when we reach the very top that we build upon learning at the cognitive level.

Teaching can be a very complex task. In addition to covering the content, teachers must understand that each student enters the learning opportunity with a variety of different previous experiences and abilities. It can be a major challenge in our setting to know each and every student's personal needs, but we can benefit from a general understanding of major brain developmental stages.

We all generally have the capacity to process and learn in all phases of the Spiral Learning Model. Yet, we don't process with the same emphasis on the phases throughout our lives. Younger learners tend to focus on exploration. Teens need our support. Adults want to focus on the story.

"Why do they act that way and how can I affect their motivation to learn?" The Learning Needs Pyramid provides a visual framework for the basics to answering that question.♦



BENJAMIN OLSON

2018

The 2018 Wolf Ridge calendar features the photography of Benjamin Olson. As a 16 year old, Benjamin received a camera from his grandfather which resulted in exploration of the natural environment and photography. With a B.A. in biology and an A.A.S. in digital imaging technology, Olson's long term goal is to promote awareness of the perils the natural world faces today while working towards conservation and environmental restoration. Benjamin has a lengthy list of awards. Most recently he received honorable mention in Nature's Best Photography Windland Smith Awards with "Time for a Nap" and he is the winner of the Art Wolfe Next-Generation Photographers grant. More of Olson's work can be seen at benjamin-olson.com. Calendars are available for \$14.00 for donor members and \$18.95 for non-donor members, including shipping. They are also available at special prices, in lots of 50 for school fundraising and retail resale. Proceeds of all calendar sales directly support children attending Wolf Ridge school programs. Email mail@wolf-ridge.org or call Wolf Ridge at (218) 353-7414 for more information and to order.♦

PROGRAMS 2017

ADULTS



- LNT Master Educator:** May 19-23: \$450 register at NOLS at nols.edu/Int
- Advanced Bird Banding Class:** June 13-17: \$950
- Beginning Bird Banding Class:** June 18-25: \$2,050
- Wilderness First Responder:** April 7-14: Starting at \$725
- Fabulous Fall Nature Geek-Out:** Sept 29-Oct 1: \$325

ALL AGES



- Open House:** July 1, 2017 9:00-4:30 **Free**
- Bird Banding Drop-in days:** June 7, 14, 21, July 6, 12, 26, & Aug 2 7:00-11:00am **Free**
- Summer Family Camps:** (all ages) July 2-8, July 30-Aug 5, Aug 6-12: Starting at \$850
- Family & Group Wilderness Trips:** Email david.butcher@wolf-ridge.org for ages, dates, and prices. Starting at \$1900
- Road Scholar Intergenerational:** (grandparents & 8-12yrs) June 25-30: Starting at \$579. Register at roadscholar.org or 877-426-8057.

YOUTH

- Summer Sampler:** (2nd-5th gr) Aug 16-19: \$370
- Discoverers:** (4th-5thgr) July 9-15, July 16-22, July 23-29, July 30-Aug 5, Aug 6-12, Aug 13-19: \$580
- Voyagers:** (6th-7thgr) July 9-15, July 16-22, July 23-29, July 30-Aug 5, Aug 6-12, Aug 13-19: \$580
- Adventurers:** (8th-9thgr) July 23-29, July 30-Aug 5, Aug 6-12: \$595
- Day Camp:** (1st-5thgr) June 26-30: \$186
- Sprouts Day Camp:** (2nd-3rdgr) June 26-30: \$186 **NEW**
- Green Energy Camp:** (4th-5thgr) Aug 13-19: \$580
- Voyagers 2-wk Ultimate Survival:** (6th-7thgr) Aug 6-19: \$1260
- Angling to Archery:** (6th-7thgr) July 30-Aug 5: \$632
- Wildlife Camp:** (6th-7thgr) Aug 6-12: \$580
- Farm, Feast, Fire Camp:** (8th-9thgr) Aug 6-12: \$580
- Camp Rock Climbing:** (8th-9thgr) Aug 13-19: \$650
- Counselor-in-Training:** (10th-12thgr) July 16-29: \$1260
- Credit Camp-Freshwater Ecology:** (10th-12thgr) July 9-29: \$2000
- Credit Camp-Wilderness Ethnics:** (10th-12thgr) July 30-Aug 12: \$1590
- BWCAW Canoe 5-day:** (7th-8thgr) Aug 13-19: \$600
- Adventurers 2-wk BWCAW Canoe:** (8th-9thgr) July 9-22: \$1350
- Adventurers 2-wk Isle Royale Backpack:** (8th-9thgr) July 16-29: \$1375
- Adventurers Northwoods Kayak:** (8th-9thgr) Aug 13-19: \$700 **NEW**
- Jr Naturalists 2-wk Quetico Canoe:** (10th-12thgr) July 23-Aug 5: \$1420
- Jr Naturalists 2-wk Apostle Islands Kayak:** (10th-12thgr) July 30-Aug 12: \$1420
- Isle Royale Kayak Expedition:** (10th-12thgr) July 2-15: \$1485
- BWCAW Traverse Canoe Expedition:** (10th-12thgr) July 2-22: \$2000



Join the funnnnnnnnn

Wolf Ridge Summer Camp Reunion Event

**Battle Creek Recreation Center
St. Paul, MN
February, 25, 2017 at 11-3:00**

Recent campers, catch up with all your camp friends and make plans for the coming summer at Wolf Ridge. Enjoy ice skating, sledding, cross-country skiing, snowshoeing, board games, hot drinks, and cookies. Bring your own ice skates and sleds. Wolf Ridge will provide some snowshoes and skis. Check in at the large classroom at the recreation center. No need to RSVP.



Kevin Cederstrom/Enterprise

Facebook, Twitter, YouTube, blog, & shop on-line at wolf-ridge.org.

Program Title _____
 Program Dates _____
 Name _____ M / F
 Parent/Guardian Name _____
 Address _____
 City/State/Zip _____
 Phone (home) _____
 (cell) _____
 E-mail _____

FAMILY PROGRAM ATTENDEES

Names and ages

CAMPERS & YOUTH TRIPS

Birthdate _____ Grade entering _____
 T-shirt size: Child S M L Adult S M L XL
 Roommate request _____

Do we have permission to include your camper's name, age and primary phone number on a carpool list sent to other registered participants? YES NO

BECOME A DONOR MEMBER

\$35 \$50 \$120 \$250 \$1000 \$ _____

Your gift supports the Wolf Ridge mission.

PAYMENT

Registrations must be accompanied by a \$150 non-refundable deposit, family programs \$150/person. Program fee minus deposit due two weeks prior to program start.

Payment Enclosed:	Donor Member	\$ _____
	Program Deposit	\$ _____
	Program Fee	\$ _____
	Total Enclosed	\$ _____

- MasterCard Discover Visa American Express
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Wolf Ridge is an accredited residential environmental school for persons of all ages. We offer immersion programs which involve direct observation and participation in outdoor experiences. Wolf Ridge programs focus on environmental sciences, human culture and history, personal growth, team building, and outdoor recreation.

Our mission is to develop a citizenry that has the knowledge, skills, motivation, and commitment to act together for a quality environment.

We meet our mission by:

- Fostering awareness, curiosity, and sensitivity to the natural world.
- Providing lifelong learning experiences in nature.
- Developing social understanding, respect, and cooperation.
- Modeling values, behaviors, and technologies which lead to a sustainable lifestyle.
- Promoting the concepts of conservation and stewardship.