



parting shot

*NFL Florida representative Joan Kyle
fishing for fossils with kids.*

NFL

NUTRIENTS FOR LIFE

NFL

SPRING
2011

NEW ELEMENTARY Curriculum

{ MONTICELLO'S }

garden

THE OUTDOOR
CLASSROOM



{ from the board }



Those of us who work in the agriculture sector don't need to think twice about the importance of fertilizers. We know, for example, that commercial crop nutrients are estimated to account for 40 to 60 percent of crop yields. With the world's population growing by 75 million people a year, the need for more abundant, sustainable and protein-rich food sources is increasing steadily—and fertilizers play a central role in meeting these needs.

Most of us understand the importance of global food security, but the sense of urgency surrounding the issue can be easy to lose sight of. After all, most of us can comfortably afford to feed our families on a relatively small fraction of our incomes. However, the reality for the majority of the world's population—for whom affordable and reliable access to food is far from secure—is much different than ours. Developing countries are under great pressure to provide food for their increasing populations.

Global food stocks are being watched closely, and potential shortages are giving rise to concerns about a repeat of the 2008 food crisis. The worldwide stocks-to-use ratio is now only slightly higher than it was in 2007 and 2008 when we experienced record price run-ups. Although the "food crisis" headlines are far fewer these days, the fundamentals of world demand and supply balance have not changed significantly since the 2008 food crisis.

Population growth continues to create pressure on global agriculture production. Global population is projected to increase from 6.8 billion people today to more than 9 billion by the middle of this century. To keep pace with population growth, we will need to increase food production by 500 million tonnes by the end of this decade. That's roughly equivalent to another U.S. harvest.

Meanwhile, the emerging middle class adds another dimension to global food security. As countries like China, India, Brazil and Indonesia become more prosperous, the demand for more protein-rich and resource-intensive diets increases as well. The potential of income-driven demand can be illustrated with a simple example: China's per capita pork consumption has increased 50 percent in the past 20 years—yet each Chinese citizen still eats less than half as much meat as an American.

Finally, with limited arable land for food production, sustainable food production is increasingly important. The greatest contribution we can make to this is to plant land already in production. By supporting more productive use of land already under cultivation, we can avoid the deforestation and land conversion that destroys habitats, threatens biodiversity and releases carbon. Fertilizer use is essential to getting the most out of this land.

These fundamentals create excellent opportunities for the Nutrients for Life Foundation and the crop nutrition sector in general. The Foundation was started in response to the general public's lack of knowledge about the importance of fertilizers. With the increasing relevance of food security, the public can't afford not to understand the central role that fertilizers play in helping to feed a growing world. I am proud to support the Nutrients for Life Foundation, and applaud them for the progress they've made in educating the public about the importance of crop nutrition.

Sincerely,
Jim Prokopanko

NUTRIENTS FOR LIFE FOUNDATION

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SPRING
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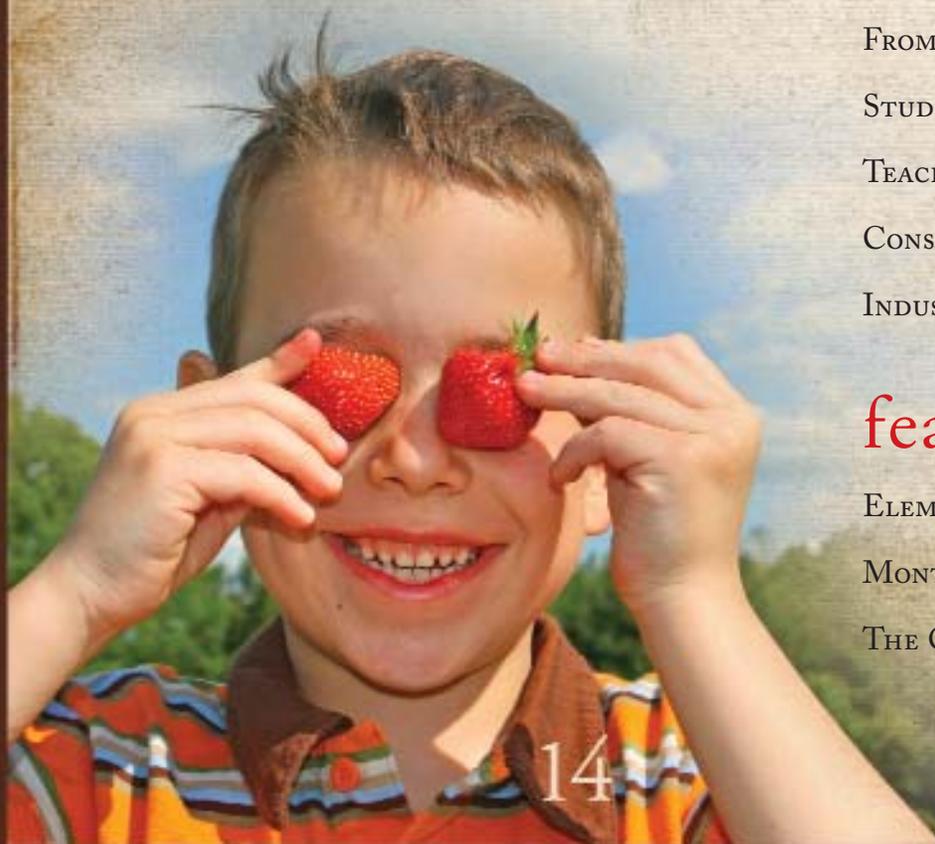


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{from the editor}

Plant and Soil Science for Elementary Students Comes Alive

The Nutrients for Life Foundation has enjoyed participating in Ag in the Classroom and National Science Teachers Association meetings around the country during recent years. During these meetings, I and others of the NFL team have enjoyed many conversations with teachers. It's a pleasure to hear from middle and high school teachers who are using our *Nourishing the Planet in the 21st Century* curricula and how they have tailored lessons to their classroom. However, at every meeting - without fail - I have been asked by elementary teachers across the country if we have a plant and soil science curriculum for young students similar to what we offer to those in middle and high school. I am now proud to say the answer is yes!

The more complex concepts of the periodic table, combined with understanding the nitrogen cycle are just out of range for most elementary students. However, the issues of world hunger and how to feed a growing population with less land and the importance of crop nutrients are not. For elementary students, we have tied plant and soil science to gardening activities, creating hands-on and fun activities. The lessons are based off our Smithsonian-endorsed *Nourishing the Planet in the 21st Century* plant and soil science curricula for middle and high school students. Specifics of the curriculum can be found on page 14 in this issue of the magazine.

Fertilizers are not an easy concept for many, let alone our

youngest citizens. However, there are basic ways to teach our youth about a plant's nutritional needs. Each spring I look forward to planting my vegetable seeds and my geranium plugs with my three young sons. This activity brings hope for a successful garden crop and beautiful flower pots. However, the seeds are just the first piece of the puzzle. If I neglect to water my plants or deny them of nutrients, I either end up with poor quality plants or lifeless plants altogether. The value of water is obvious. The value of plant nutrients, or fertilizers, is more subtle. However, the garden is a great example to teach this concept, and this is what the elementary curriculum is built upon.

It is fitting that since teachers at NSTA and NAITC initiated the creation of this curriculum by continuing to ask for it, that we will be debuting it during the NSTA annual conference in March in San Francisco. So when you stop by the Nutrients for Life Foundation booth at the many conferences we attend each year, please be sure to share with us your wish list for plant nutrient-related education materials. We are always looking to provide educators with the tools needed for the classroom.

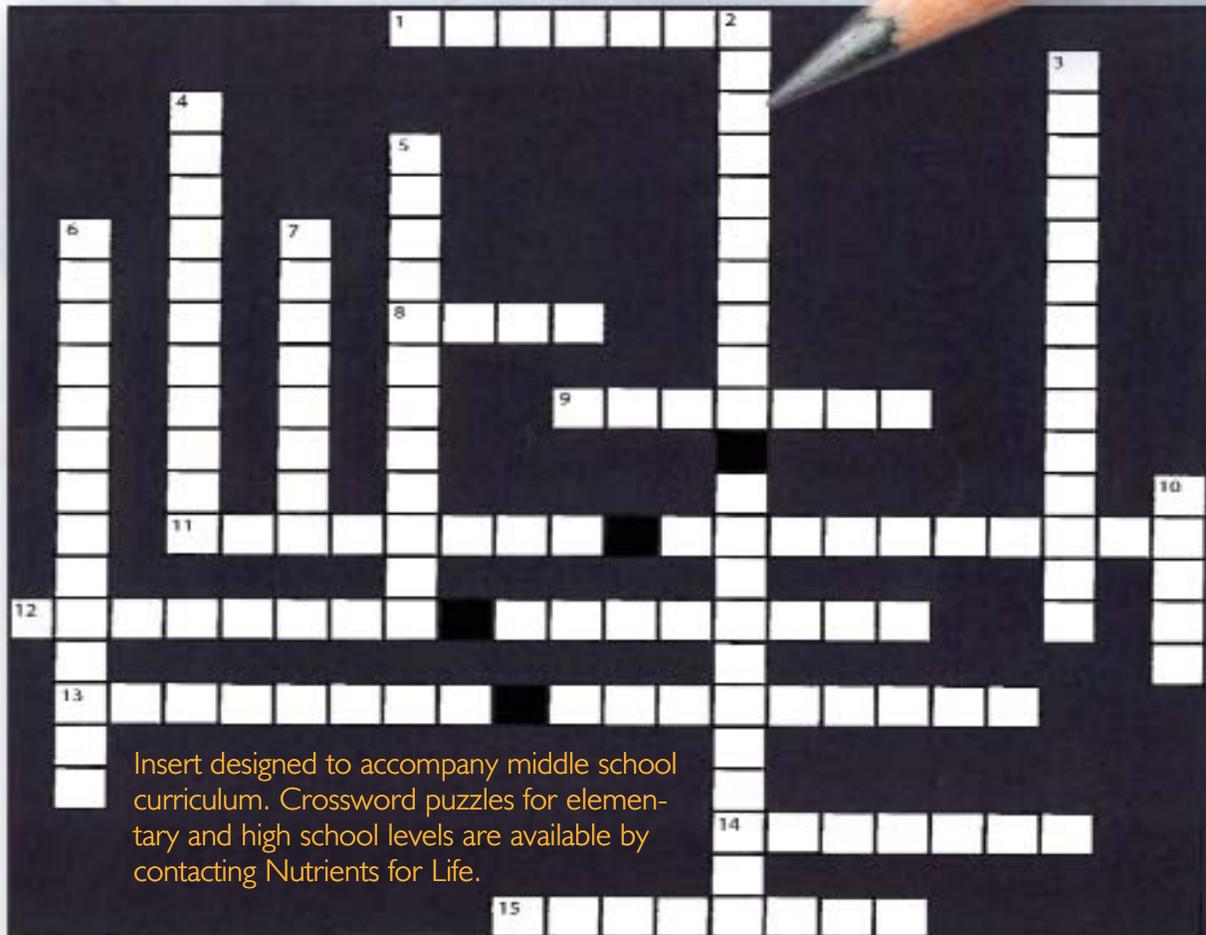
Harriet E. Wegmeyer

Harriet Wegmeyer
Executive Director, Nutrients for Life Foundation



{ students }

Nourishing the Planet in the 21st Century **Plant and Soil Science***



Insert designed to accompany middle school curriculum. Crossword puzzles for elementary and high school levels are available by contacting Nutrients for Life.

Down:

- _____ contain nutrients in known amounts that plants can immediately use. (2 words)
- These are nutrients required in small quantities to ensure the health of an organism, and are often used as cofactors for enzymatic reactions.
- The process by which water moves downward through openings in the soil.
- _____ is the process by which water penetrates into soil from the ground surface.
- _____ are the nutrients that must be present in a relatively large amount to ensure the health of an organism.
- A _____ is any of 17 essential mineral and non-mineral elements necessary for plant growth.
- _____ is the conducting tissue that transports water and dissolved nutrients in vascular plants.

*Answers to the puzzle can be found on page 10.

Across:

- _____ materials come from plant and animal sources, as well as from bacteria and other microorganisms.
- _____ is a soil textural class generally thought to have properties most favorable for crop production.
- By 2050, the world's population will have reached nearly nine _____ people.
- This is a condition where the amount of a nutrient essential to the health of an organism is lacking or present in an insufficient amount. (2 words)
- A biological or chemical process by which elemental nitrogen, from the air, is converted to organic or available nitrogen. (2 words)
- _____ is the presence of excessive amounts of nutrients such as nitrogen and phosphorus in surface water, groundwater, air and non-agricultural land. (2 words)
- Plants _____ nutrients from the soil.
- _____ is the percentage of soil volume that is not occupied by solids.

{ teachers }

Interview with Teacher **Jeff Gerard**

During his fourth year of teaching at Hansen High School, Jeff Gerard and his FFA members won first place in the Nutrients for Life Helping Communities Grow competition. Find out more about Jeff and his fondness for teaching in this small rural community of about 1,000 in South Central Idaho.

What do you enjoy most about teaching? What I enjoy most about teaching is watching students grow mentally and socially and eventually finding success in some pursuit in life. Many times the rewards come years after I have had them in school when I see them and they tell me about their family, education, jobs and life. It's nice to know I may have been a small part of their success, as when a student I had 12 years ago in an animal science class tells me of their successes as a veterinarian or a student I taught construction skills to now manages a major construction business. Many students over the years have told me that they use a certain skill or bit of knowledge they gained in my class in their everyday jobs or careers.

How do you teach your students about fertilizer? Plant science has always been a favorite subject of mine. My wife, who is a 1st grade teacher, is my partner in a small greenhouse business each spring. We grow and sell flower and vegetable bedding plants to our neighbors and acquaintances, then plant an acre garden from which we sell produce to the public all summer. Three years ago, I assisted the students in building a 16 X 40 greenhouse which my classes use to grow and sell flower and vegetable plants to the public. Hansen FFA chapter has also acquired use of a 3 acre plot from the school which is mostly planted into vegetables by the students. Students help all summer in taking care of the garden and selling produce at our stand throughout the growing season. This serves as a fundraiser for many FFA activities. In class and in the garden, I try to instill in students the importance of quality fruits and vegetables in maintaining a healthy lifestyle, and then tie that knowledge to the necessity of proper plant nutrition. We learn about soil testing, essential plant nutrients, soil pH, watering and growing techniques, etc. We even



Hansen High School Teacher Jeff Gerard
Years in Teaching: 27
Discipline: Agriculture
School: Hansen High School
Location: Hansen, Idaho

“The rewards of teaching agriculture for me have been many. Teaching others has helped me broaden my own understanding of important careers in our world, and agriculture will always rank number one.”

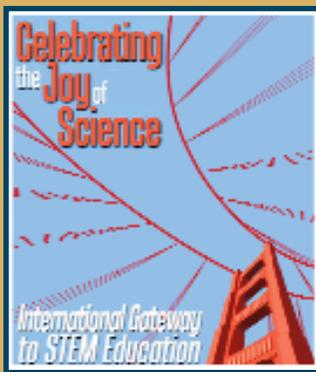
Nutrients for Life and FFA Partnership Extended



Many FFA students in California and Iowa are spending the spring months learning and teaching about plant nutrients, all thanks to a competition sponsored by the Nutrients for Life Foundation.

Nutrients for Life expanded its *Helping Communities Grow* program to include FFA chapters in California and Iowa, in addition to FFA members in Florida and Idaho. The goal of the *Helping Communities Grow* chapter recognition program is to give FFA chapters the opportunity to help their communities become better informed about the positive role of plant nutrients, fertilizers and related agricultural issues through educational, community building and hands-on activities. Stay tuned to hear which school in each state will walk away with bragging rights and the award money.

To learn more about this partnership and how your state can become involved, please contact Nutrients for Life at info@nutrientsforlife.org.



Come See Us! March 10-13

2011 NSTA National Conference • San Francisco, Calif.

The Nutrients for Life Foundation will participate in the National Science Teachers Association (NSTA) National Conference on Science Education, held March 10-13 in San Francisco. The exhibit booth (**Booth #2612**) will offer the newly-released elementary curriculum on plant and soil science. In addition, information will be available to teachers to improve student understanding of the role plant nutrients have on the environment, crops, food and people's health. Extensive student and teacher materials, including complimentary copies of the plant and soil science curriculum, *Nourishing the Planet in the 21st Century*, will be distributed. If you will be at NSTA, please visit our booth!

experiment some and have fun finding our own techniques for successful plant production. Our garden is grown mostly on plastic mulch with a drip irrigation system.

What is the most rewarding experience that you've had teaching students about agriculture? One of the most rewarding experiences I have had as an agriculture teacher was the recent award my FFA members received from Nutrients For Life Foundation in the Helping Communities Grow Chapter Recognition Program. Seven-thousand dollars given to 24 small-school kids for their efforts in promoting the need for commercial fertilizer to feed the world, was a big thing for them! I think it helped many in this small community realize that with some effort, anybody can succeed.

We continue to get feedback from people in the area about the program we put together - especially in regards to the wonderful service a fresh produce stand in this small community serves, and comments about the road signs we displayed all summer - causing them to think about the importance of fertilizer in their lives.

The rewards of teaching agriculture for me have been many. Teaching others has helped me broaden my own understanding of important careers in our world, and agriculture will always rank number one. Watching students find their place in this huge world and realizing that their small contribution is vitally important to the existence of others has been the most rewarding part of teaching for me.

{ consumers }

Dig It! Exhibit Draws in Crowds of Teachers at Durham Events

As a main sponsor of **Dig It! The Secrets of Soil**, the Nutrients for Life Foundation was pleased to see great turnout at events at the Durham Museum in Omaha. The **Dig It!** exhibit was a showcase attraction at the museum from Oct. 2 through Dec. 26. During that time, museum visitors – including many educators and students – learned a bit more about nutrients and soil.

“We are so excited about the opportunity **Dig It!** provided in educating visitors of the Durham Museum on the importance of healthy soil in our daily lives,” said Nutrients for Life Foundation Executive Director Harriet Wegmeyer. “People of all ages will have the chance to learn something new from this exhibit.”

Nutrients for Life participated in two key events during the soils exhibit’s stay at the Durham. Teacher’s Night welcomed nearly 1,000 educators from the surrounding area to see the vast resources the Durham has to offer, including educational materials from Nutrients for Life. This festive, after-hours open house, gave teachers a chance to hear what’s new at The Durham and other regional institutions. Highlighting this year’s event was educators from the Smithsonian Institution presenting lessons from the Smithsonian Institution’s traveling exhibition **Dig It! The Secrets of Soil**. Participants enjoyed take home free classroom-ready materials and information about field trips and programs available to students.

Let’s Get Dirty Day drew approximately 500 guests to explore the soils exhibit. Durham visitors found out about the many ways people use and move dirt with an event that takes being messy to a whole new level! Museum guests got up close with large earth moving equipment provided by John Deere, learned about the many types of organisms who call dirt their home and how dirt needs nutrients to grow healthy crops! Nutrients for Life member Agrium offered its popular Seed —



THE DURHAM™ MUSEUM



Survivor booth where guests learned about healthy soil and planted a sunflower seed.

The **Dig It!** exhibit was housed in the Smithsonian Museum of Natural History in Washington, D.C., from July 2008 to January 2010.

Pictured: Visitors enjoyed special activities at the Durham during Let's Get Dirty Day and Teacher's Night in conjunction with the Dig It! exhibit.

Kirby Agri Inc. Trucks Feature Nutrients for Life Support

Last year, Nutrients for Life got its first-ever logoed piece of transportation equipment. 2011 has brought its second. Thanks to the generosity of Kirby Agri, the Nutrients for Life name and logo will be riding around town on Kirby Agri delivery trucks. A proud sponsor of the Foundation, Kirby Agriculture wanted to expose even more people to the messages the Nutrients for Life Foundation communicates.

“Unique partnerships with our donor-members have resulted in some incredible projects,” said Nutrients for Life Foundation Executive Director Harriet Wegmeyer. “Kirby Agri approached us about this concept as another means of getting the fertilizer education message to people. Obviously, we jumped at the opportunity to create a rolling billboard, and are grateful for Kirby Agri’s generosity.”

Kirby Agri Inc., is the largest wholesale fertilizer distributor in the northeast and mid-Atlantic. Products range from fertilizer and plant nutrients to feed ingredients and ice melt products and are available for commercial, industrial and residential customers. In 2010, the Nutrients for Life Foundation took the railroads by storm with the unveiling of a logoed railcar. The railcar, offered by GATX, is in active duty delivering potash to terminals in the United States and Canada.

Pictured: Standing in front of one of their delivery trucks, are Kirby Agri employees and family members Chip, Rick, Michelle, Mary, Carroll and Tom Kirby.



For more information about Nutrients for Life Foundation, visit www.nutrientsforlife.org, call (800) 962-9065 or visit Nutrients for Life on Facebook and Twitter (@Nutrients4Life).

Nourishing the Planet in the 21st Century Plant and Soil Science Crossword Puzzle

Answer Key:

- | | |
|---------------------------|-------------------------|
| 1. Organic | 9. Billion |
| 2. Commercial fertilizers | 10. Xylem |
| 3. Micronutrients | 11. Nutrient deficiency |
| 4. Percolation | 12. Nitrogen fixation |
| 5. Infiltration | 13. Nutrient pollution |
| 6. Macronutrients | 14. Extract |
| 7. Nutrient | 15. Porosity |
| 8. Loam | |



Nutrients for Life **Grows Worldwide**

2010 was a year of planning and strategy for Nutrients for Life Canada. It underwent a number of changes, like the addition of a new Executive Director – Tim Woods, and the appointment of a new Chairman – Terry Baker. With a new and diverse Board of Directors, composed of conservationists, farmers, scientists, educators, and industry specialists, NFL Canada has been working together to determine its future direction. Working closely with its Board, NFL Canada has developed a number of initiatives which it hopes to launch this year.

In North America, there is a growing concern that children and youth are losing touch with agriculture and are unaware of exactly where their food comes from. Fortunately, there has been increasing interest in community and school gardens in Canada. There are many reasons for schools to initiate a school garden including the opportunity to show students just how soil nutrition and seeds combine with proper care to produce the food that feeds the world. It's also worth noting that other gardens are started by teachers equally interested in beautifying their school yards, giving kids team-building opportunities, introducing students to agricultural career opportunities and facilitating lessons about the challenge of feeding the world. Nutrients for Life Canada is hoping to use its website to act as a showcase and catalyst for all science-based gardens. NFL Canada is excited about the potential to ride this small but growing wave of interest in the food cycle.

Canada's diverse climate doesn't allow for outdoor learning 365 days a year, so NFL Canada questioned how to keep kids

interested during those cold winter months. How about a virtual field trip? Students could be transported, through the wonders of technology, to an experimental farm or an agricultural research center. The idea is to create interactive videos, which would virtually transport the kids to a local conservation site, or a farm across the country, and eventually maybe even somewhere else in the world.

Following in the footsteps of the U.S. Nutrients for Life, NFL Canada welcomed two regional representatives to its team. These science teachers in the Province of Manitoba have accepted the challenge of spreading our message and sharing resources with their students and other teachers in the Province. NFL Canada hopes to expand the program to

include representatives across the country, and looks forward to seeing it grow in the coming years. These initiatives are showcased on its new website, at www.nutrients-forlife.ca, which was launched in December of 2010.





1 Fertilizer Is Life's Main Ingredient Posters

A series of four educational campaign posters.



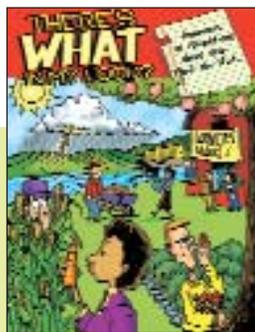
2 Fertilizer Is Life's Main Ingredient Bumper Sticker

Showcases the Foundation's message of Fertilizer, Life's Main Ingredient.

Materials Available



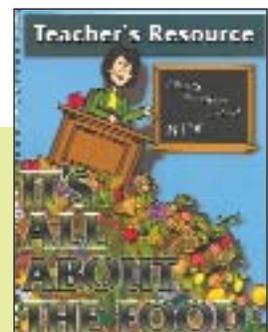
3 Seed Bookmarks
Deliver these cute and creative seed bookmarks to the classroom. The bookmark coordinates with the *Nourishing the Planet in the 21st Century* curriculum. Students can remove the "plant container," plant it in the soil and watch the flowers grow.



4 There's What in My Food?
A fun and valuable resource for teenagers and adults, *There's What in My Food?* offers insight to improve understanding about modern production agriculture and why it is so important in assuring plentiful, affordable and safe food supplies.



5 Fun With the Plant Nutrient Team
The perfect piece to help children (grades 3-5) understand the basics of crop nutrition.



6 It's All About the Food
A resource for middle school teachers that focuses on problem solving and critical thinking in relation to food. *It's All About the Food* is divided into three sections to teach students about food production, plant nutrients and fertilizer.



For more information on items featured here, please contact the Nutrients for Life Foundation, at info@nutrientsforlife.org.

10

Recipe Cards

A series of four recipe cards. Recipes include pumpkin soup, chocolate chip cookies, baked spaghetti cakes and vegetable soup.



13

Take A Closer Look Series

Fertilizer for Better Bread: Find out how the protein content in wheat correlates to the nitrogen fertilizer applied to the field.

Nutrition and Your Diet: Learn how fertilizer nutrients ensure the food eaten meets micronutrient requirements.

Fertilizer in Your Salt Shaker: Whatever the intended use, as a food supplement or a fertilizer nutrient, the potassium chloride consumed is exactly the same.

Nutrients in the Soil: Take a look at the role fertile soils play in producing high quality food.

11

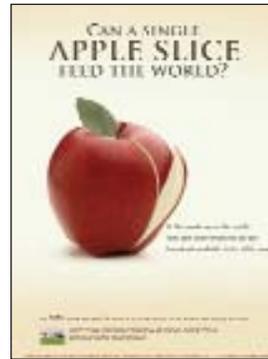
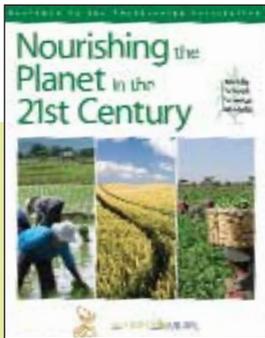
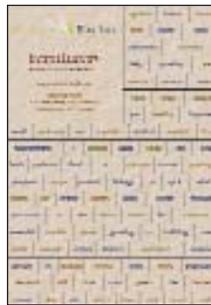


Apple, Air and Ocean Postcards
Series of three postcards highlighting the origins of nitrogen, potash and phosphate.

12

Magnets

Make sentences with these word magnets about gardening, growing crops and nutrients.



Apple Poster

Can a single apple slice feed the world? This is a great resource poster for teachers to use as they address the challenges of feeding a growing population.

14

7

Nourishing the Planet in the 21st Century Curriculum

Nourishing the Planet in the 21st Century is a science-based curriculum supplement for middle and high school students. The supplement offers six lesson plans designed to teach students about feeding the growing world.

8

5 Key Message Cards

The wallet-sized 5 Key Message Card concisely states five of the top truths about fertilizers.

9

Ruler

Six-inch ruler that publicizes the *Nourishing the Planet in the 21st Century* curriculum.





IT'S ELEMENTARY!

The Nutrients for Life Foundation is proud to announce the release of a new elementary plant and soil science curriculum. Like our already-developed middle and high school plant and soil science curriculum – *Nourishing the Planet in the 21st Century* – the elementary version falls within national science teaching standards.

Plant and Soil Science Education is for Elementary Students Too!

The curriculum's big debut will occur during the National Science Teachers Association (NSTA) conference in March. The curriculum is available to teachers free-of-charge and will be accompanied by an online virtual classroom. The virtual classroom will serve as an addendum to topics covered within the curriculum, and will provide teachers with yet another source of application for their students.

The curriculum features five lessons, ranging from properties of soils to plant growth and essential elements, and clearly outlines the major concepts and objectives of each lesson. Gardening plays an essential role in this curriculum, as it provides a hands-on approach to learning about the importance soil plays in healthy plants. Through a variety of experiments, students are able to watch plants grow before their eyes, while they examine each stage of growth. By the end of five lessons, students not only understand what plants need in order to stay healthy, but they will have the opportunity to plan what their own dream garden might look like.

Keeping in mind the many requirements teachers must meet, this curriculum was developed so that teachers can select the lessons that most easily fit into their schedule, but may easily choose to teach all five lessons if they have

time. Each of the five lessons provides teachers with a mini-lesson intended to guide them through answering their students' questions and accurately depicting the major concepts.

Like *Nourishing the Planet in the 21st Century*, the new elementary curriculum relates science to the real world in fun, applicable ways. Students will take in information about

the plants around them, discover the many properties of soil, and will eventually understand the relationship between plants and the soil in regards to nutrients.

Teachers who participated in the pilot testing of the new curriculum found that the majority of students tested after the lessons accurately grasped the most important concepts.

The Nutrients for Life Foundation also incorporates other major learning concepts into the curriculum aside from basic science knowledge. Students certainly take away major science concepts, but also learn other useful skills like drawing conclusions

from data, measurement, percentages, comparisons and use of creativity and imagination. 🌱

For more information about ordering your own copy of the elementary curriculum, visit www.nutrientsforlife.org or call (800) 962-9065.

Elementary School Plant and Soil Science Curriculum

The new curriculum features five brand-new, hands-on lessons to bring elementary students to understand the importance of knowing where food comes from.

Lessons include:

- ♦ **Plants Around You**
- ♦ **Properties of Soils**
- ♦ **Plant-Soil Interactions**
- ♦ **Plant Growth Affects Soil**
- ♦ **How Does Your Garden Grow?**

“We are beyond excited to share this curriculum with teachers,” said Nutrients for Life Foundation Executive Director Harriet Wegmeyer. “We’ve spent a long time planning and are finally ready to get elementary-aged kids involved learning about the importance of nutrient-rich soil and food production.”

To learn more about Monticello, visit the
web site at www.monticello.org

MONTICELLO'S

garden



Thomas Jefferson was a devoted gardener and a pioneer in modern farming practices, and his estate made clear his love for the soil. Nutrients for Life's spokesperson and blogger, Dee McKenna, writes about her family's trip to the estate where they spent the day exploring the expansive fruit and vegetable gardens and taking in the beauty of the trees in all their autumn glory.

We needed a vacation, time away from the hustle and bustle of our busy lives. This time it was to Virginia to visit family. Scheduled into every great McKenna vacation is a trip to a garden, park, greenhouse or arboretum. This time it was Thomas Jefferson's Monticello.

I have read many of Jefferson's garden quotes; it was my time to see firsthand the inspiration of those quotes. Approaching Monticello is gorgeous, trees full of color and life! I was most interested in the garden, although his home is as equally interesting.

Jefferson's vegetable garden is a 1,000 foot-long terrace carved into the mountain. You can imagine my delight in seeing such a historic garden. Jefferson grew 330 varieties of vegetables and herbs and 170 varieties of fruit in the eight-acre fruit garden. That is some serious gardening.

My first observation of the garden was the red clay type soil. Fascinating to know the third president and I have a common garden frustration, clay soil! Jefferson was an advocate for improving soil health. He regularly added compost, including manure and composted leaves to his garden. He was a witness to how the organic matter increased drainage and promoted greater fertility.

The garden was his living laboratory. He wrote, "The failure of one thing is repaired by the success of another." Reassuring to know that Jefferson and I both killed a few plants. He collected seeds and cutting from all over the world. He is accredited for introducing a wide range of vegetables, herbs, fruits and perennials to America.

In Peter Hatch's book, "The Gardens of Thomas Jefferson's Monticello," he writes of Jefferson's philosophy. Here is an excerpt.

Jefferson's essential philosophy of gardening was perhaps best summarized in a letter to his daughter Martha after

she complained of insect-riddled plants in the Monticello vegetable garden: "We will try this winter to cover our garden with a heavy coating of manure. When earth is rich it bids defiance to droughts, yields in abundance, and of the best quality. I suspect that the insects which have harassed you have been encouraged by the feebleness of your plants; and that has been produced by the lean state of the soil. We will attack them another year with joint efforts."

Jefferson understood the success of his garden was a direct relation to the health of the soil. I continued to be fascinated with Jefferson's garden enthusiasm. I read a portion of "Thomas Jefferson's Farm Book." In it, I discovered that in 1816, Jefferson began adding plaster to the soil. Plaster is calcined gypsum, also known as plaster of Paris. It provides two macro-nutrients to the soil, sulfur and calcium. Jefferson wrote to Richard Peters in June of 1816, "We are indebted to you for much of our knowledge as to the use of the plaster, which has become a principal article of our improvements, no soil profiting more from it than that of the country around this place."

Today, gypsum is still utilized by gardeners and farmers to improve soil fertility and drainage.

Reflecting back on our tour of Monticello, I walked away with a new appreciation for Jefferson's wisdom, work ethic and patriotism. I had known Thomas Jefferson as the third President of the United States and the principal author of the Declaration of Independence, and now I know him as a fellow gardener.

Jefferson truly believed the failure of one thing to be the success of another, a concept that continues to be true to this day, even in gardening. 🍀



To catch up on past blogs and to read Dee's newest postings, visit www.nutrientsforlife.org and follow us on Facebook and Twitter (@Nutrients4Life).



An Educator's View of Bringing Gardening into the Classroom

Take it

Utsi

There is a revolution going on! Have you heard of it? Teachers, students, parents, and community volunteers are partnering together to bring learning into outdoor classrooms. It's the Outdoor Learning Classroom revolution, and it is growing all across America!

By JENNY ESTES // MASTER GARDENER & UNIVERSITY OF NORTH TEXAS SUPERVISOR OF STUDENT TEACHING



Learning should create joy, amazement and wonder. It should activate curiosity and the desire to learn more about an idea or subject. Eager faces scrutinize a venus flytrap as its trigger hairs close. A few feet away, hands are busy picking up grapes with tongs and large spoons while discovering how birds' beaks adapt to their habitats for food. Close by, children's eyes widen with amazement as they discover what has eyes but cannot see, while learning how a potato grows.

de!

Spontaneous laughter is heard while children chase bubbles representing the carbon dioxide and oxygen exchange that sustains life on our planet. Other young learners are creating newspaper hats to represent what plants need to survive. A small group of children are huddled to the ground intent on "sucking a bug" as they observe tiny insects breaking down living matter in a compost bed. This is how we learn best at any age. It is a "hands-on," discovery method that activates our senses. I have described to you what goes on in an outdoor classroom on a regular basis. The activities are from the Junior Master Gardener® Curriculum and represent a paradigm shift: cooperative learning through outdoor connections. As teachers, we have noticed our students becoming

technologically savvy while disengaged from natural processes. Life lessons learned through observing and participating in nature benefit the whole child. It activates a void that is exhibited in children's behavior as well as their ability to retain information. An added benefit is the fact that bringing students outside to observe life processes rejuvenates both student and teacher.

This paradigm shift in education begins with training our teachers, students and parents to be comfortable with learning in the outdoor world. The Outdoor Learning Classroom brings the best education has to offer in learning theories, cross-curriculum design as well as "out-of-the box" thinking to make a real difference in the way we engage our students to become life-long learners.

Consider three key factors for success when beginning an Outdoor Learning Classroom. First, observe your community for the best place to begin when building outdoor classrooms. Reach across the aisle to organizations who share a passion for connecting children to outdoor learning. It has been my experience that the collaborative efforts of interested organizations make for a richer learning environment for all involved.

Second, be open to what is available for creative outdoor spaces. In our community, not only are outdoor classrooms located on school property but one of our more successful adventures is a field trip to a Master Gardener's backyard. The Master Gardeners Association, 4-H Club and Master Naturalists, all under the umbrella of the Texas AgriLife Extension Service, have partnered with the local school district to provide a two-hour field trip targeted for third graders. The field trip provides eight learning stations that accommodate approximately 100 students at a time. The lessons taught at each station are aligned with Texas Essential Knowledge and Skills standards and follow the curriculum of the Junior Master Gardener® program, an international youth program within the University Cooperative Extension network. The outdoor garden experience covers lessons on plant life essentials, oxygen/carbon dioxide exchange, carnivorous plants, vegetable square-foot gardening, bug aspirators, bird



beak tools and more. This program has grown to reach 550 students during a school year.

Third, when establishing an Outdoor Learning Classroom on school property, the teachers need training as well as the students. To address this need in our community, the same Texas AgriLife Extension organizations partnered with the school district to offer in-service training for the teachers during the summer. The goal is to make Outdoor Learning Classrooms (OLC) a sustainable and critical component of the curriculum, while empowering the teachers to manage their OLC and to use it for all disciplines.

Littlejohn, *Sharing Nature with Children I and II* by Joseph Cornell and *Place-Based Education* by David Sobel. Of particular interest is the conclusion of Robert Marzano in his new book, *The Highly Engaged Classroom*. Marzano, a leader in educational research, suggests the importance of obtaining attention and student engagement through school-wide application of knowledge. The Outdoor Learning Classrooms as described in this article are excellent examples of this theory.

Educators listen when passion is supported by concrete research. So if you are the educator or the volunteer trying to

Our Level I, three-day teacher training named SWAT (Science With Attitude), covers how to build raised beds, container gardening, native plants, funding resources, considerations for an OLC such as incorporating ponds, theme gardens and summer management. This level also introduces the Junior Master Gardener® (JMG) program and core curriculum to the teachers. The participating teachers receive the JMG core curriculum teacher's guide, the student handbook and funding for a bus so that their class can attend the field trip mentioned earlier. The books and the bus funding are provided by the school district. Level 2 focuses on creating habitats in the OLC with a concentration on butterflies, bees and other pollinators. This level utilizes a teaching technique called FLOW learning, from Joseph Cornell's book *Sharing Nature with Children*, Volumes I and II. The teachers are introduced to many activities that will prepare their students to comfortably engage in nature activities with concentration and interest. The Volume II *Sharing Nature with Children* and the Junior Master Gardener® *Wildlife Gardener* are provided for teachers by the school district. Uniquely, in this training volunteers train the teachers, rather than the more traditional model of volunteers working in the schools directly with the children. This change empowers the teachers and the entire school to take ownership of the program.



The Outdoor Learning Classroom is a place that engages students with cross-curriculum subjects and integrates teachers and parents through real-life learning. The research-based benefits have been praised and established in many recent books, such as *Last Child in the Woods* by Richard Louv, *Greening School Grounds* edited by Tim Grant and Gail

support an outdoor classroom in your area, take the time to broaden your understanding of this new revolution in education. If you have not had the opportunity to read the research presented in the books mentioned, I strongly hope you will do so. Most of all, I challenge you to get out there and join the Outdoor Learning Classroom Revolution! 🌱

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