

# Plant & Soil Curriculum Guides

**Junior Master Gardener** (available through Texas A&M Cooperative Extension at <http://www.jmgkids.us/>)

**The Junior Master Gardener Level 1 Teacher/Leader guide:** \$36.00, also available in Spanish.

Provides teachers with the resources to teach students about the wonderful world of gardening. There are eight chapters with hands-on, novel learning experiences for youth. The curriculum also includes activity pages, worksheets, JMG rhythms, reading passages formatted for standardized tests, and much more. After studying life skills and careers, students may culminate their learning experience with service activities. This JMG curriculum is designed for students in grades 3-5 and is complimented by the JMG Level 1 Junior Master Gardener Handbook (\$15.00) Developed by Texas Agricultural Extn. Service, Texas A&M University.

**Golden Ray Level: Wildlife Gardener** Grades 3-5 (2005) \$33.00

The National Wildlife Federation and the Junior Master Gardener program have joined forces to create an engaging learning opportunity for children. This curriculum will help children learn about the habitat needs of wildlife and develop a greater appreciation for the environment. The program culminates in a community service project, as the students develop a site recognized by the NWF as a Certified Schoolyard Habitat. (230 pp.)

**Golden Ray Level: Literature in the Garden** Grades 3-5 (Reprint 2007) \$33.00

This curriculum seeks to engage children through powerful garden- and ecology-themed children's books. It uses six books to inspire learning through outdoor activities, creative expression and open exploration. Dozens of hands-on activities encourage leadership development, individual responsibility, community involvement, and the development of critical thinking skills. (224 pp.)

**Golden Ray Level: Health & Nutrition from the Garden** Grades 3-5 (1999, reprint 2007) \$28.00

Children are motivated to eat the fruits of their labor in their study of "Health and Nutrition from the Garden." This imaginative curriculum teaches children that growing and eating nutritious fruits and vegetables is rewarding and fun. This teacher/leader guide has six learning concepts, with activity pages for children and program information for leaders.

**Level 2: Operation Thistle--Seeds of Despair** Grades 6-8 (2005) \$33.00

This level 2 curriculum for the Junior Master Gardener program combines the teacher/leader guide with reproducible pages for young participants. Through dozens of exciting and fun activities, students can investigate plant growth and development, take part in service learning projects, and earn certification--all while undertaking an urgent mission to defeat Dr. Thistle! (204 pp.)

**Level 2: Operation W.A.T.E.R.--Dr. Thistle Goes Underground** Grades 6-8 (2007) \$33.00

While following the continuing saga of the evil Dr. Thistle and his plot to rule the earth's ecosystems, students in grades 6-8 can learn important lessons on soils and water. Topics in this book include soil color, texture and structure; soil nutrients; soil improvement; soil conservation; the water cycle; aquifers, watersheds and wetlands; water movement; and water conservation. Each of the eight chapters contains three hands-on activities to reinforce the concepts covered. Also included is a section on service learning and career exploration projects connected to soil and water. (212 pp.)

The following titles; **4-H Gardening, Discovering Plants, Down to Earth and Eco-Wonders**, are available through the 4-H Curriculum Shop @ <http://www.nc4h.org/publications/curriculum/> (you must purchase through your NC 4-H office to receive discounted price.)

**4-H Gardening** (Grades 3-12)

Youth who like to work outdoors and get their hands dirty, plant seeds and watch them grow, will enjoy this series. Developed by Purdue University.

A – **See Them Sprout:** Ages 9-10 \$3.95

Youth learn to plan a garden as well as plant the seeds, use garden tools safely and harvest crops. Youth autograph pumpkins, grow plants from roots, make a rain gauge and roast pumpkin seeds. (44 pages)

B – **Let's Get Growing:** Ages 11-12 \$3.95

Youth use transplants in a garden, start seeds indoors, observe how plants respond to light and grow new plants from plant parts. They

make a worm box, freeze vegetables and make a compost pile. (44 pages)

**C – Take Your Pick:** Ages 13-15 \$4.40

Youth learn to test and improve soil, extend the growing season, cross-pollinate flowers and assist others in garden projects. Youth also explore photosynthesis, plant, harvest, and dry herbs, and learn to pickle vegetables. (56 pages)

**D – Growing Profits:** Ages 16-19 \$4.40

Youth explore double crop planting methods, the effects of pollution on plants, plant genetics, pest management and starting a plant business. Youth learn how to construct raised beds for planting, investigate hydroponics and spuds in space. (60 pages)

**Gardening Helper's Guide** \$4.75

This guide provides the helper with activities, ideas and content to help support youth growth and learning in a caring and supportive environment. Included are easy-to-use reference tables and group activities. (108 pages)

**4-H Discovering Plants:** (Ages 10-11) \$2.50, also available in Spanish

This curriculum is for the youth who are future botanists, landscape designers, greenhouse owners, or home gardeners. Youth can learn to measure the girth, crown, and height of trees, how to identify a tree by the leaf pattern, how to landscape a yard, grow herbs, and which parts of plants are edible. Some fun experiments are how light affects the growth of plants, the four ways to propagate plants and fun activities--leaf printing, roasting sunflower seeds, germinating seeds, making dill vinegar and herb sachets.

**Leader's Guide:** \$1.50

This manual offers suggestions to assist the helper in meeting the needs of youth as they apply what they are learning to the life skills of critical thinking, learning to learn, communication, and planning and organizing.

**Down-to-Earth – Gardening in the Classroom** \$10.00 Grades 4–6

Down-to-Earth assists the helper in using gardening as a means to explore plant growth and development. Through this hands-on, minds-on program, youth learn the basics of botany, the gist of gardening, the essentials of ecology and much more. Through gardening, youth stimulate their senses and cultivate science process and life skills. By gathering data via the scientific method, youth feel a sense of pride and responsibility. This award-winning 88-page activity guide is an excellent resource for school enrichment programs, organized 4-H clubs, school-age child care educators, after-school programs, nature centers, summer youth camps, scouts and traditional school settings. Developed by North Carolina A & T University. (144 pages)

**4-H Exploring Your Environment** (Grades 3-12)

Youth experience the challenge and excitement of exploring the ecology, science, and technology of the environment.

**1 – Eco-Wonders** \$4.25

Youth experience the four elements of life, connections among living things and how all plants and animals are affected. (60 pages)

**2 – Eco-Adventures** \$4.25

Youth engage in encouraging and challenging outdoor activities. (68 pages)

**3 – Eco-Actions** \$4.25

Youth develop scientific thinking and processing skills in relationship to basic ecological concepts. (68 pages)

**Exploring Your Environment** Helper's Guide \$4.25

Useful information and activities for helpers to plan, manage and teach an environmental education program are the mainstays of this guide. (60 pages)

Set of 4 PC-07708 \$16.00

**4-H Acres of Adventure** (Grades 3–5)

Introduce young people to the world of agriculture and life sciences while expanding your collection of fun-filled after-school science activities keyed to national standards. Uniquely themed guide containing 40 hands-on lessons developed in cooperation with curriculum specialists from the National Consortium of State Agriculture in the Classroom programs, Extension 4-H professionals and experts from the field of child-care education. It was designed to increase agricultural literacy among 3rd through 5th grade audiences while developing their understanding, appreciation and application of science through a variety of agriculturally-based activities.

### **Acres of Adventures 1** \$7.50

Adults and older youth will enjoy using these lesson plans to quickly engage youth in learn-by-doing agriculture activities within the following thematic units: Plant Detectives, Mystery Agriculture, All about Agriculture, Fast Food Agriculture. (100 pages)

### **Acres of Adventures 2** \$7.50

This group activity guide for the after school teacher provides ready to use lesson plans that will quickly involve youth in experiential activities related to the following thematic units: Insect Invasion, Farm Physics, Agriculture Gone Wild, Frontier Living. (100 pages)

Set of 2 PC-08332 \$14.50

## **Soil Solutions**

The 4-H Soil Solutions enrichment curriculum is developed for a third grade audience interested in learning about plants and soils in a fun, interactive way. Aligned to meet the science standard course of study in plant and soils, the lessons draw from current research and knowledge from NC State's crops, horticulture and soil sciences department. Includes eight lessons covering the following topics: soil properties, soil and water relationships, soil and plant growth, composting, seed germination, pollination and flowers, and plant growth and development. Available for free download at: (Publication in final editing stage: email Liz at [liz\\_driscoll@ncsu.edu](mailto:liz_driscoll@ncsu.edu) for a pre-press copy)

## **4-H Growing in the Garden** (Grades K-3)

K-3 curriculum that grows curiosity about agriculture, natural resources, food and people. From Iowa State. 2000.

Teachers and students are having fun teaching and learning-by-doing these classroom lessons. Standards and benchmarks were used to create more than 40 kindergarten through third grade science, social studies, language arts, history, math, music, and art lessons. The lessons and four outdoor classroom plans help students develop important life skills such as communication, critical thinking, responsibility, learning to learn, and healthy lifestyle choices. Teachers report that these lessons fit into existing lesson plans, the format is easy to follow, and the materials are readily available. More than 16 pages of resources are listed in the appendix. Order through Iowa State Extension at: <http://www.extension.iastate.edu/GrowingintheGarden/>, Curriculum \$49.50, Leaders Guide, \$49.50

## **Garden Mosaics**

Garden Mosaics is a program designed for youth and their adult leaders that combines intergenerational mentoring, community action, and understanding different cultures. Youth learn from elder community members, who share their gardening practices, cultural backgrounds, and wisdom about their community. Youth also learn from the Garden Mosaics educational resources and activities. Activities take place in community gardens, neighborhoods, home and school gardens, and indoors. Youth participants are from community centers, camps, home schools, classrooms, and science enrichment, job skills training, intergenerational, service-learning, and environmental education programs. Developed by Cornell University. For more information visit: <http://www.gardenmosaics.org>. Garden Mosaics Kit (includes program manual, DVD, poster, etc), \$79.98 or Program Manual, \$19.99

## **Roots n' Shoots**

Roots and Shoots is a program started by Dirck and Molly Brown to connect youth with gardening and incorporates intergenerational cooperative learning. They have created two Roots and Shoots garden and developed a curriculum and handbook to help folks get started. This Down to Earth Handbook has everything you will need to know about implementing your own garden program. It is a hands-on, feet-first approach to a school garden where everyone can have a good time learning and working together.

This step-by-step guide includes:

- A notebook binder format for easy duplication of materials and addition of your own ideas
- 200+ pages of useful, how-to information, detailed lesson plans for each grade covering natural science, literature, music, art, and math, with templates and samples for class projects and publicity pieces.
- Detailed designs, planting, equipment and structures for each of the seven theme gardens.
- Suggestions for ways to involve school staff, students, volunteers, and community organizations.
- Ways to get started, how to recruit and train volunteers, fund raising strategies, and how to create effective publicity.

To order the handbooks (Volume 1 and Volume 2) at \$35 a piece, visit: <http://www.rootnsnshoots.info/>

## **GrowLab: Activities for Growing Minds** (Grades k-8)

Whether you're growing in a greenhouse, in a GrowLab® Indoor Light Garden, or on a windowsill, *Activities for Growing Minds* will help spark students' curiosity about plants and invite them to think and act like scientists. Developed by the National Gardening Association and

written and field-tested by educators, this complete curriculum uses fun, illustrated activities to explore plant life cycles, examine plant diversity, and investigate the interdependence of plants, humans, and other living and nonliving things. It's a must for any plant-based studies! Meets National Science Standards; 307 pages. (1990). Eve Pranis & Joy Cohen, Natl. Gardening Assoc. \$24.95

### **GrowLab: A Complete Guide to Gardening in the Classroom**

You'll find everything you and your students need to know about indoor gardening in this comprehensive book by the National Gardening Association. From planning and planting an indoor garden to tackling pests and other challenges, this well-written, easy-to-follow resource will guide you to growing success. Highlights include; Setting up an indoor garden, planning and planting, choosing vegetables, herbs, and flowers to grow indoors, maintaining a healthy growing environment, tackling pests and other problems, conducting special gardening projects. 112 pages. \$19.95. Available from the National Gardening Association. <http://www.kidsgardeningstore.com/>

### **Soil Science** (Grade 2-3)

Hands-on lessons lead teachers and students through soil science basics. Includes ongoing, performance and formal assessment tools, encourages cooperative learning and sections that relate soils to the real world.. Meets the National Science Education Standards (NRC) Delta Science Module (2004). Available through Delta Education. [www.delta-education.com](http://www.delta-education.com). Teacher's Guide, \$79.00. Complete Kit, \$367.00

### **Soil and Life** (Grades 6-12)

This resource and activity book, written by Dr. Robert Ridky for the American Geologic Institute, contains 6 lessons and 23 activities on topics such as physical and chemical weathering, components of soil, water porosity and permeability, land use, and more. Written to the National Science Education Standards, each lesson contains a clear objective and background information on science content and an instructional approach. Activities are hands-on and incorporate questions that promote critical thinking. Most activities can be completed with simple classroom equipment and supplies. Binder includes separately bound teacher's guide and reproducible, loose-leaf student activity sheets.(2003). Available through Carolina Biological Supply at [www.carolina.com](http://www.carolina.com). \$44.50

### **Food, Land and People: Resources for Learning.** (Grades k-12) 2003, revised edition.

Available (usually free) through the North Carolina Soil and Water Conservation Division through participation in training workshops. FLP is a Pre-K to 12 curriculum designed to help people understand the interrelationships among agriculture, the environment, and people of the world. The curriculum consists of 55 hands-on lessons, with subjects ranging from environmental science and stewardship to human populations and land use issues. Contact Sandra Weitzel, Div. of Soil and Water Conservation, Raleigh Regional Office, 1628 MSC, Raleigh NC 27699-1628 (919)-791-4200, [sandra.weitzel@ncmail.net](mailto:sandra.weitzel@ncmail.net)

### **Ag in the Classroom**

Sponsored by the North Carolina Farm Bureau, its goal is to help students gain a greater awareness of the role of agriculture in the economy and society, so that they may become citizens who support wise agricultural policies. Contact: Ms. Louise Lamm, North Carolina Farm Bureau AITC; P.O. Box 27766, Raleigh, NC 27611 (919) 783-4319, [louise.lamm@ncfb.org](mailto:louise.lamm@ncfb.org).

### **The Food Project**

Amazing program initiated in Massachusetts, connecting youth to growing food in sustainable ways. Their goal is to create fertile ground for new ideas about youth and adults partnering to create social change through sustainable agriculture. A series of publications that range from the logistics of setting up a youth farm and managing a program, to developing a farm market stand as well as activities books for youth development. Visit [www.thefoodproject.org](http://www.thefoodproject.org) for more information and to order books.

- *French Fries and the Food System*, 2001, Sara Cobyln, The Food Project.
- *Growing Together: A Guide to Building Inspired, Diverse and Productive Youth Communities*, Gale, G.

#### Program Manuals:

- Academic Year Program Manual
- Rural Agriculture Manual
- Summer Youth Program Manuals, Vol. I, II, & III
- Farmer's Market Manual
- Urban Agriculture Manual
- Volunteer Manual

**National Junior Horticultural Association (NJHA) Study Manual:** This manual is strictly horticultural information. Youth can attend a national convention and participate in a horticulture contest consisting of plant identification, knowledge test and judging. There are also opportunities to compete in essay contests, photography and projects for children ages 5-14 in a program called Young America. Each state has an NJHA coordinator. Visit their site at: <http://www.njha.org/>

- **North Carolina State NJHA Coordinator:**  
Liz Driscoll, NC State University, 218 Kilgore Hall, Box 7609; Raleigh, NC 27695; 919.513.7346; [liz\\_driscoll@ncsu.edu](mailto:liz_driscoll@ncsu.edu)
- Online study manual: [http://www.njha.org/projects\\_hortid.html](http://www.njha.org/projects_hortid.html) Download a pdf:  
<http://www.ces.ncsu.edu/4hplantandsoils/NJHA%20manual.pdf>

### Math in the Garden (ages 5-13),

*Math in the Garden* uses a mathematical lens to explore the magical arena of gardens. Colorful watercolor illustrations depict children, youth and adults discovering patterns, measuring crops, tasting new fruits and vegetables, planting in circles, and graphing their observations of fruits, flowers and shadows. The University of California Botanical Garden, in collaboration with the Lawrence Hall of Science, has developed engaging math activities that anyone can do. Designed to promote inquiry, language arts and nutrition, the activities are grouped by the predominant mathematics strands and support the National Council of Teachers of Mathematics (NCTM) *Principals and Standards of School Mathematics* and the National Academy of Sciences *National Standards for Science Education*. 2006. National Gardening Association. \$29.95, <http://www.gardeningwithkids.org/11-3111.html>

### Teaching Green: The Middle Years (Grades 6-8)

Teaching Green – The Middle Years was designed to serve as a complete “green” teaching resource for those working with middle school-aged youth, inside or outside of schools. Readers will find a wealth of kid-tested ideas contributed by educators from across North America and covering a wide spectrum of environmental topics, from biodiversity to resource consumption to green technology. They include practical projects and new learning strategies that will inspire educators seeking innovative ideas for incorporating green themes into their programs. Grant, Tim and Gail Littlejohn (eds.) 2004. New Society Publishers, \$22.95; <http://www.greenteacher.com/middlebook.html>

Misc. Curriculum

### Horticulture (Grades 4-5)

From Virginia Cooperative Extension are six free downloadable lessons on horticulture, from peanuts, to sweet potatoes to pollination. <http://www.ext.vt.edu/resources/4h/4hpubs/pdfs/388-804.pdf>

Also from Virginia Cooperative Extension:

Stems and Stamens (Ages 14-18): <http://www.ext.vt.edu/resources/4h/4hpubs/pdfs/380-020.pdf>

Sprouting Up (Ages 14-18): <http://www.ext.vt.edu/resources/4h/4hpubs/pdfs/380-022.pdf>

It's More than Just Dirt (Ages 14-18): <http://www.ext.vt.edu/resources/4h/4hpubs/pdfs/380-020.pdf>

### Radishes to Riches: A Produce Marketing Project for Youth

Eames-Sheavly, Marcia. 1992.. Cornell Cooperative Extension. Download here:  
<http://www.gardening.cornell.edu/education/youth/activities/pdfs/radishes2.pdf>

Many other great resources from Cornell: <http://www.hort.cornell.edu/gbl/pubs/index.html>

### Vegetable Gardening

From University of Kentucky a vegetable gardening guide for youth: <http://www.ca.uky.edu/agc/pubs/4bc/4bc07pa/4bc07pa.pdf>

### Books with Gardening Activities

Bradley, Clare. 2000. *Fun With Gardening: 50 Great Projects Kids Can Plant Themselves*. Hermes House.

Chasek, Ruth. 2000. *Essential Gardening for Teens*. Children's Press.

Frutig Bales, Suzanne. 1996. *Ready, Set, Grow!: A Guide to Gardening With Children*. Macmillan.

Gertley, Jan and Michael. 1997. *The Family Garden: Clever Things to Do in, Around and Under the Garden*.

Hannemann, M. et al. 2007. *Gardening with Children*. Brooklyn Botanical Garden.

Kite, L. Patricia. 1995. *Gardening Wizardry for Kids*. Barrons.

- Lovejoy, Sharon. 1991. *Hollyhock Days*. Interweave Press, Loveland, CO.
- Lovejoy, Sharon. 1999. *Roots, Shoots, Buckets & Boots*. Workman Pub., NY.
- Lovejoy, Sharon. 2001. *Sunflower Houses*. Workman Publishing, NY.
- Mannes, J and M. Rehnes. 2001. *Seeds of Change: Learning from the Garden*. Dale Seymour Publications
- Rhoades, Diane. 1995. *Garden Crafts for Kids: 50 Great Reasons to Get Your Hands Dirty*. Sterling Pub., Co.
- Richardson, Beth. 1998. *Gardening With Children*. Taunton Books.
- Rushing, Felder. 1998. *Scarecrows: Making Harvest Figures & Other Yard Folk*. Storey Books.
- Shanberg, Karen and Stan Tekiela. 1991. *Plantworks*. Adventure Publications, Cambridge, MN
- Starbuck, Sara, Olthof, Marla and Karen Midden. 2002. *Hollyhocks and Honeybees: Garden Projects for Young Children*. Redleaf Press.
- Talmage, Ellen. 2000. *Unearthing Garden Mysteries: Experiments for Kids*, Fulcrum Kids

## Creating Youth and School Gardens

- Billimore, B., Brooke, J., Booth, R. and K. Funnell. 1990. *The Outdoor Classroom: Educational Use, Landscape Design and Management of School Grounds*. Building Bulletin 71, Department for Education, UK.
- Damrosch, Barbara. 2001. *Theme Gardens*, Workman Publishing.
- Dannenmaier, Molly. 1997. *A Child's Garden*, Simon & Schuster. Reprinted as: *A Child's Garden: 60 Ideas to Make Any Garden Come Alive for Children*, 2008, Timber Press
- Gifford, A. *Steps to a Bountiful Kids Garden*. National Gardening Association, 2001.
- Grant, T. and Littlejohn, G. *Greening School Grounds: Creating Habitats for Learning*. Green Teacher, 2001.
- Guy, L., Cromell, C. and L. K. Bradley. 1996. *Success with School Gardens*. Arizona Master Gardener Press, Phoenix, AZ. Free for download at: [http://cals.arizona.edu/youthgardens/marketplace/success\\_book/PDF\\_list.html](http://cals.arizona.edu/youthgardens/marketplace/success_book/PDF_list.html)
- Jaffe, R. and G. Appel. *The Growing Classroom: Garden Based Science*. Life Lab, Santa Cruz, CA.
- Johnson, K. and M. Bjornson. *The Chicago School Garden Initiative: A Collaborative Model for Developing School Gardens that Work*. Chicago Botanic Garden, 2003.
- Kiefer, J. and M. Kemple. 1998. *Digging Deeper: Integrating Youth Gardens into Schools and Communities*. Common Roots Press.
- Life Lab Science Program. *Getting Started: A Guide for Creating School Gardens as Outdoor Classrooms*. The Center for Ecoliteracy, Berkeley, CA.
- Matthews, Clare. 2005. *Great Gardens for Kids*, Hamlyn
- Moore, Robin. 1993. *Plants for Play*, MIG Communications.
- Oscone, L. and E. Pranis. *The National Gardening Association Guide to Kid's Gardening: A Complete Guide for Teachers, Parents and Youth Leaders*. John Wiley & Sons, 1990.
- Pranis, E. and J. Hale. *GrowLab: The Complete Guide to Gardening in the Classroom*. National Gardening Association, 2006.
- Rivkin, Mary S. 1995. *The Great Outdoors: Restoring Children's Right to Play Outside*, Nat'l. Assoc. for the Education of Young Children.
- Schoolyard Mosaics: Designing Gardens and Habitats*, 2003, National Gardening Association, S. Burlington, VT.
- Sowing the Seeds of Success*, 1999, Marcia Eames-Sheavly & National Gardening Assoc
- Steps to a Bountiful Kids' Garden*, 2001, National Gardening Assoc.

## Subject Books (Misc.)

- Trail, Gayla. 2005. *You Grow Girl*, Fireside Publishing
- Goldenberg, Janet. 1994. *Weird Things You Can Grow*, Random House.
- Bartholomew, Mel. 2006. *All New Square Foot Gardening*, Cool Springs Press