

by
Julie Agranoff,
David Corsa,
Jesse Raudenbush,
and Joet Reoma,
Eberwhite School Composting & Project Grow,
AAPS School Gardens Workshop, 4 March 2013

Acknowledgement:

- Project Grow Community Gardens Compost Education Center (CEC)
- AAPS Farm to School Committee and
- Eberwhite School Green Team and School Composting Program
- Starr Valley Farms
- Michigan Master Composter Program, The Washtenaw County Consortium for Solid Waste Management
- Leslie Science and Nature Center



- A. Hisotry of the Eberwhite School Composting
- B. Project Grow's Compost Education Center (CEC)
- C. Vermiculture Composting
- E. Best Practices
- E. Web Resources

A. The History of the Eberwhite School Composting Program





2008: Early Beginning . . .

- Eberwhite <u>Green Team</u> formed as a parent volunteer group.
- Applied to be a <u>Michigan Green School</u>;
- Formed the <u>Green Team Committee</u>.
- Each year the idea of composting in the lunch room was floated.
- It did not come through until the 2011-2012 school year.

2011: Then Came A Change . . .

- Bill Harris became principal; he was more <u>open-minded and</u>
 <u>supportive</u> to the idea of composting and recycling.
- With his support, the <u>Green Team Co-Committee Chairs</u> attempted with daily composting in the lunch room.
- The Green Team also attempted <u>Single Stream Recycling</u> at the same time.
- Set up separate <u>bins for recycling and composting</u>.
- Had a <u>parent volunteer to oversee the disposal</u> of leftover food and containers at the end of each lunch period.

work hard now. it'll pay off later.







Julie Agranoff, Eberwhite parent who was instrumental in getting the collection process started.

2011: More Parents, Teachers and Kids Got Involved...

- All <u>volunteers would gently educate kids</u> about putting leftover fruit and vegetable waste into the composting bins.
- Began in October and had 6 weeks able to participate in the city composting program.
- By December, the city suspends pick-up, had to find an <u>alternative place for our compost to go</u>.
- Gardening Committee was <u>unable to take it</u>.
- A <u>parent who owns on a farm</u> volunteered to take it every 2 days and feed it to her chickens. But as winter progressed and students getting the usual illnesses, she worried about the risk of feeding the compost to the chickens.
- Once again we had to reevaluate.



Dave Corsa, examining a bag of lunchroom food waste, thought of Project Grow's CEC as a recipient. Dave, a first grade teacher at Eberwhite School, spearheads the teachers' involvement in Eberwhite's lunchroom composting program.

2012-2013: A New Partnership With CEC

- Finally, Dave Corsa contacted Project Grow's <u>Compost Education Center (CEC)</u>, and initiated a partnership with CEC. CEC volunteers pick up food waste from Eberwhite School every Friday.
- For part of the year there are also <u>composting</u>
 <u>bins</u> in the 4th grade classroom for a science
 unit on composting and vermiculture.
- Also, our Kindergarten teacher Linda Joseph keeps a <u>worm bin in her classroom</u>.
- Eberwhite School Composting program is being <u>run solely by parent volunteers</u>, and still looking for ways to get the teachers and students more involved.
- Eberwhite's partnership with Project Grow's Compost Education Center (CEC) "<u>has been very</u> <u>successful</u>".



2013: A New Partnership, Expected Benefits

- New Opportunities in the Eberwhite—Project Grow Partnership
 - 1. Eberwhite students, parents and teachers are excited to be contributing to the CEC of Project Grow. Eberwhite's lunchroom waste become food for Project Grow's vermiculture. Eberwhite School now have visitation rights to the large high-capacity worm bin at CEC.
 - 2. Opportunity to visit the Leslie Science and Nature Center where CEC is located.
 - 3. Avail the use of Project Grow's outdoor classrooms on Vermiculture and Mushroom Gardening at CEC,
 - 4. Opportunity to visit the Leslie Discovery Gardens of Project Grow.
 - 5. Eberwhite parents and teachers can avail of Project Grow instructors to provide demonstration talks on composting, organic gardening, vermiculture, and other innovative, ecology-based gardening for the school.

B. Project Grow's Compost Education Center (CEC)

Background, Mission, Goals and Position of CEC



1. Background of CEC

- a. <u>A Unit of Project Grow</u> founded in 1972.
 Mission: we inspire, create and manage community gardens. Current number of community garden sites: 20
- b. <u>CEC Location</u>: Leslie Discovery Garden of Project Grow, on the grounds of the Leslie Science and Nature Center (LSNC)
- c. <u>Achievements</u>: A CEC existed in 1980's at Leslie Science Center, operated by the city. Re-born in 2011 by Project Grow. Number of Classes & Workshops: *many*. Number of Workdays: *many*. Number of Large Composting Bins: 11. Number of Outdoor Classrooms: 2.





2. The Mission of CEC

- a. To <u>inspire lifelong learning</u> among both Young Sprouts and the Wise Roots in organic gardening and waste management.
- b. To <u>advance the knowledge and the art</u> of composting as the managed process of creating the ideal conditions for the rapid decomposition of organic waste; and
- c. To <u>strengthen community linkages</u> by helping design composting systems that can serve dual functions of compost-learning and compost-making.



3. The Goals of CEC

- a. Support two <u>certificate programs</u> in Washtenaw County: the Organic Gardening Certificate at WCC, and the Master Composter Certificate of the City of Ann Arbor. Coming soon, a certificate in Vermiculture.
- b. Provide <u>composting workshops and demonstrations</u> through spring, summer, fall and winter.
- c. Strengthen <u>community partnerships</u> with private and public education institutions.



Best Practice – Composting For Community Gardens and School Gardens

- **a. Compost-Use-In-Gardening Policy**. Gardeners must use only compost (humus) in the garden.
- **b.** Composting Policy. For large community gardens like Project Grow, composting policy varies by site. As a general rule, <u>any organic waste from the garden may be tilled into the soil, collected and processed in designated composting area on-site, or taken home for composting by the city. Diseased plants should always be removed from the site, to minimize pathogens in the gardens.</u>
- c. Composting Education. Composting is an essential component of organic gardening regardless of plot size, structure and form of the community garden. Especially in school garden programs, gardening and composting must be learned together by starting a Basic Compost Education program focused on practical ecology in such topics like teaming with earthworms in your garden so they do the tilling, and sheet-mulching to prevent weeds. Connect composting education with studies in Waste Reduction, Reuse, and Recycling.
- d. Community Solidarity. <u>Strengthen the gardening community</u> through classes and workshops, volunteer workdays and gardening events, entertainment shows, and gardening newsletter. The focus here is to cultivate future gardeners (Young Sprouts) through parental and adult (Wise Roots) examples while creating a strong sense of belonging to the gardening community.

Recommended Courses: Three Sample Curriculum for Basic Composting Education

1) Natural Decomposition (Sample Curriculum)

- a) In nature, dead organic matter decomposes slowly back to soil through the actions of microbes.
- b) Microbes are micro-organisms (bacteria, fungi) and macro-organisms (worms, insects) found on plants, animals and in the soil.
- c) The rate of decomposition depends on: the presence of decomposers, the type and size of materials, temperature, moisture, and aeration.
- d) How slowy does Nature work? Fresh wood chips, left alone, will decompose in 2-3 years.

2) How We Mimic Nature's Decomposition in Composting (<u>Sample Curriculum</u>)

- a) Composting is the managed process of speeding up the way nature recycles by creating ideal conditions for rapid decomposition of organic materials.
- b) The seven (7) ideal conditions for composting include: (1) Presence of nature's decomposers (bacteria & fungi, worms & insects); (2) the right mix of greens and browns; (3) particle size of ingredients; (4) right amount of moisture; (5) aeration; (6) temperature generated either by recipe or by containment design; and (7) hardworking humans with some knowhow or willing to study ecology.
- c) Discuss hot and cold composting methods and vermiculture.
- d) How fast can composting work? Compost pile can stabilize and become humus (compost) between a few weeks to 6 months.

3) Why Learn Composting in Schools (Sample Curriculum Planning)

- a) Each student generates 1 to 2 pounds compostable waste each school day.
- b) 60-85% of school waste could be recycled or composted.
- c) Composting can significantly reduce waste stream & disposal costs.
- d) Composting can be a learning platform that can be integrated into school curriculum science, math, creative writing, problem-solving, nature appreciation, industrial arts and crafts, food production, socialization, and more.
- e) Decomposition of organic material contributes to the production of methane gas (climate change gases) in landfills.
- f) Compost is an essential soil amendment that provides nutrients to plants, soil stability, erosion control, pest and disease control, and more.
- g) Composting is vital to effective gardening.

C. Vermiculture Composting In Community Gardens and School Gardens

- 1. Definitions: VermiFarming = VermiCulture + VermiComposting
 - a. What is VermiCulture? It is the culture of earthworms in order to continually increase their number to obtain a sustainable harvest for various purposes. Its goal is to maximize worm production.
 - b. What is VermiComposting? It is the process by which worms are used to convert wastes as quickly and efficiently as possible into a humus-like material known as vermicompost, which contains vermicastings, compost from other decomposers, and partially decomposed matter. Its goal is to maximize vermicompost production.
 - c. What is VermiFarming or WormFarming? The combination of the two, vermiculture and vermicomposting, to maximize yield of earthworms and their castings.







2. Teaching & Learning Considerations For Worm Composting In The Classroom

- a. Adapt and teach the Basic Science of Composting as it applies to vermiculture. Composting is the managed process of speeding up the way nature recycles by creating ideal conditions for rapid decomposition of organic materials. The seven (7) ideal conditions for composting still apply (presence of decomposers especially the species of earthworm chosen, mix of greens and browns, particle size, moisture, aeration, temperature, and caring humans).
- b. Adapt and teach the basic zoology behavior of chosen worm species (usually E. fetida) living in contained space.
 The usual classroom setup is a plastic bin with holes for aeration with or without provision for excess moisture, temperature, ammonia, and vibration.
- c. Adapt and teach Worm Bin Maintenance and Management Skills. Students must be taught how to maintain the earthworms by giving them knowhow and skills to manage the composting process.



- a. Teach students not only the science knowhow (the Basic Science of Worm Composting and Worm Food Preferences), but also the maintenance skills ("Worm Bin Zoo Management"). Develop S.M.A.R.T goals for the school composting project.
- b. Maintain records of worm count at start and at harvest times, log of daily weight of worm feed, temperature, and of maintenance tasks performed by assigned teams. Help students analyze the logs.
- c. For adequate air flow, drill many vent holes or a large hole on one side of the bin, and same hole size on the bin cover. Cover paste the large holes with fine hardware cloth to prevent large insects or animals enter the bin.
- d. Study the reasons worms leave the bin and ways to prevent it. Avoid future worm flight due to excessive moisture, heat, ammonia, acidic or toxic food, and exposure of the bin to noise and vibrations. If worm bin produces too much liquid, put drain holes to keep the worm compost from getting too soggy, and use a second bin to catch and hold the liquid ("worm tea").



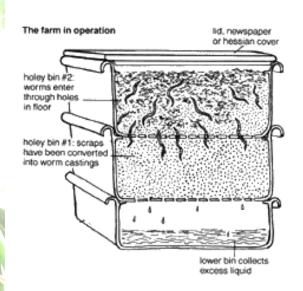




Table for harvesting worm bin.

3. Best Practices in Worm Composting In The Classroom (continued)...

- e. Avoid flying insects from laying eggs on the surface of rotting food by covering the surface completely by moist beddings.
- f. Prepare another bin to store and hold dry beddings.

 Beddings can be coconut coir, sawdust, shredded newspaper. This bin can also contain rolled newspaper to be used later for absorbing excess liquid (worm tea).
- g. Assign students to visit and feed the worm bins during school break and have them write news reports about it.
- h. Harvest worms and worm casting before winter and beginning of spring. Estimate how much earthworm have been lost or gained. Donate what you have gained to CEC for winter keeping. If you lose much, purchase some from Starr Valley Farm or from Project Grow.
- Caring for the Worm Composting is really easy. Teachers must be creative in encouraging and assigning this task to the students.
- j. Maintain partnership with Starr Valley Farms as the source for worms and information on starting a vermiculture system; and Project Grow's CEC as a resource and demonstration site for learning practical ways for school vermicomposting.

D. Summary - Some Best Practices For School and Community Composting Program

- Develop a full plan with SMART goals, with a sequence of composting education curricula, certificate of completion, poster shows and awards, creative writing, and end-of growing season workshops.
- 2. Find somebody or a group to champion or spearhead the program.
- 3. Develop the program with a diverse committee that includes custodial staff, school administrators, teachers, parents, food service, etc.
- Make the daily composting routine a staff duty that can be done in lieu of other duties such as bus duty, detention, cafeteria, tutoring, chaperon duty.
- For hot composting outdoor, form volunteer composting teams consisting of parent/child (family) to help in turning the compost and do the temperature and record-keeping logs.
- 6. Publicize tangible success to the school community. Do a poster show and contest for composting activities.
- 7. Do an informal MOA to acknowledge outside partners. Be grateful to these organizations and to all volunteers.
- 8. For classroom vermicomposting, have students log weight of disposed waste.
- 9. Use biodegradable plastic bags to enforce frequent waste pickup.
- 10. Create a larger base of support of people and organizations. Partner with Project Grow and Starr Valley Farm to bank excess earthworm harvest and restocking.

E. Web Resources for School Composting

- a. Composting In The Classroom: Scientific Inquiry for High School Students, by Nancy Trautmann and Marianne Krasny. Selected by the National Science Teachers Association to be included in NSTA Recommends, a collection of the best science education books:
 http://cwmi.css.cornell.edu/compostingintheclassroom.pdf
- b. Cornell's A Guide For Student Composting Research: http://compost.css.cornell.edu/CIC.html
- c. School Composting Options by the Northeast Recycling Council, Inc. (NERC): http://www.nerc.org/documents/schools/SchoolCompostingOptionsPresentation.pdf
- **d. Michigan Farm to School Blog**: http://blog.mifarmtoschool.msu.edu/2012/11/school-composting-in-michigan-your.html
- e. Compost Gardening: http://www.compostgardening.com/compostawarenessweek.html
- f. Tools to Reduce Waste in Schools: http://www.epa.gov/wastes/education/toolkit.htm
- g. Lesson Plans & Other Resources for School Recycling: http://www.paperrecycles.org/school_recycling/index.html
- h. Websites for School Composting:
 http://www.compostsantacruzcounty.org/School Composting/school links.htm
- i. Green School Resources: http://www.dec.ny.gov/chemical/8803.html
- j. A School Waste Reduction, Reuse, Recycling, Composting & Buy Recycled Resource Book: http://www.dec.ny.gov/docs/materials_minerals_pdf/schoolhb.pdf
- k. The Green Team: http://www.thegreenteam.org
- I. Cornell Composting in Schools: http://compost.css.cornell.edu/schools.html
- m. School Composting: http://journeytoforever.org/edu-compost.html
- n. US EPA Composting Resources: http://cfpub.epa.gov/schools/top-sub.cfm?t-id=43&s-id=281
- o. Project Grow's Compost Education Center (CEC): http://projectgrowgardens.org/cec
- p. Practical worm information for local folks: http://StarrValleyFarms.com
- q. Primary educational resources on worm composting: http://wormwoman.com
- r. eBook, Google book: *How To Grow A School Garden, A Complete Guide for Parents and Teachers*, by Arden Bucklin-Sporer and Rachel Kathleen Pringle, 2010.

Website: projectgrowgardens.org

Email:

Julie Agranoff, Co-Committee Chair Eberwhite Green Team, Eberwhite School jekagra@aol.com

David Corsa, First Grade Teacher, Eberwhite Elementary School corsa@aaps.k12.mi.us

Jesse Raudenbush, Vermiculturist, Master Gardener, Master Composter jesse@projectgrowgardens.org

Joet Reoma, Master Composter, Organic Gardener, Permaculture Designer joet@project growgardens.org