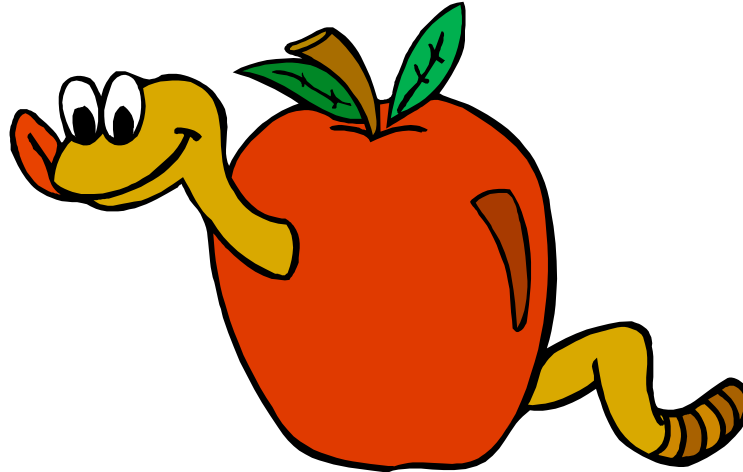


Public Library Kids Workshop: It's A Worm's World: Vermicomposting

Created by the Vermont Agency of Natural Resources Compost Center



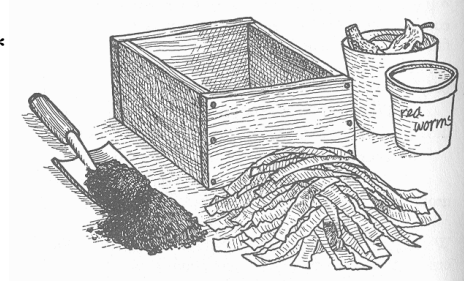
1½ Hour Workshop
Designed For Kids Age 6-12

Children Will:
Read About Composting, Worms, and Decomposition
Learn About Nature and Helping the Environment
Make Their Own Take-Home Wormbin
Learn How To Compost At Home
Have Fun!

*Included: List of Materials; Suggested Book List; Easy to Follow
Instructions & Script for Workshop; Take Home Materials for Children*

What You'll Need:

- ✓ Old newspapers
- ✓ Empty Xerox paper boxes or similar sized boxes (ask local businesses)
- ✓ Clear garbage bags
- ✓ Soil/Dirt/Dry Leaves
- ✓ Red Worms (*Eisenia fetida* or *Lumbricus rubellus*)*
- ✓ Watering can
- ✓ Markers, stickers, etc. for decorating
- ✓ Tape or glue
- ✓ A nail and hammer (to punch holes in boxes)
- ✓ Kids composting books
- ✓ Photocopier



*There are many red worm suppliers that you can buy from. Be careful about ordering worms in the winter. Though some companies guarantee them, you'll be still stuck with the hassle if they don't survive. Community members with their own worm bins may also be a good resource.

Some nearby suppliers include:

Down to Earth Worm Farm of Vermont
Lynette Courtney/Carol Schminke
PO Box 66, 281 The Bend Road
Greensboro Bend, Vermont 05482
802-533-9836
newleaf@vtlink.net
www.downtoearthwormfarmvt.com

Wormpost Northeast
161 Henway Road
Morristown, VT 05661
802-888-4364
worms@wormpost.com
www.wormpost.com

Connecticut Valley Worm Farm
PO Box 206
Enfield, CT 06083-0206
info@ctvalley.com
http://www.ctvalley.com

Cape Cod Worm Farm
30 Center Avenue
Buzzards Bay, MA 02532
508-759-5664
Capeworms@aol.com

Gardener's Supply Company
Store: Intervale, Burlington
Mail Order: 888-833-1412
http://www.gardeners.com

Pleasant View Farm
Peter and Amy Crane
234 East Side Road
Addison, ME 04606
866-222-0037
pcrane@midmaine.com
www.downeastahworms.com

The Soilcomp Composting Co.
12 Reder Rd
Northfield Ct.06778
compsoil@hotmail.com
www.compsoil.com
Toll Free 877-compsoil

Pousse Menu
2125 Hingston
Montreal, QC
514 486-2345
pousse@mblink.net

The Workshop: Introduction to Composting & Book Reading

- ❖ Gather kids in a room with plenty of workspace.
- ❖ Introduce yourself, and have the kids say their names.
- ❖ Ask intro questions:

Who knows what composting is?

Do any of you compost at home with your family?

Do you have a garden at home?

- ❖ Give brief intro to composting:

Composting is another form of recycling. Instead of throwing food scraps and yard trimmings into the trash, you can use them to create compost, a kind of soil that's really good for gardens and lawns. In a compost pile, worms, bugs, bacteria, and fungi help break the food down into little pieces and turn it into soil with lots of good nutrients that help plants grow. It's called "decomposition." Have you ever seen a fallen tree in the woods with mushrooms and bugs on it? That's a form of composting in nature – the bugs and mushrooms help decompose the tree and turn it back into soil for another tree to grow in.

- ❖ Read and Discuss Children's Books about Composting (Feel free to substitute other available books, and come up with your own questions):

-Squirmy Wormy Composters by Bobbie Kalman and Janine Schaub

-What happened when Soo put all the worms to sleep?

-Why couldn't any plants grow?

-Do worms like sunlight?

-What do worms like to eat?

-How do worms help plants?



- The Magic School Bus Meets The Rot Squad : A Book About Decomposition

-What were some of the things that helped break down the log?

-What did the log turn into?

-What did they use the soil from the old log for?

-Do you think logs are the only things that decompose? What else might?

- ❖ Ask who wants to make their own worm bin?

The Workshop: Making Worm Bins

- ❖ Give each child a copier paper or other similar sized cardboard box, garbage bag, and old newspaper (pair any children without permission to bring home a box with those who do have permission). Set out markers, stickers, glue, tape, etc. to decorate with.
- ❖ Have kids decorate the outside of the boxes and write their names on them.
- ❖ Attach the “Caring For Your Worms” sheet to the top of the boxes.
- ❖ Poke holes in the top of the boxes (explain that this will give the worms air to breathe, and keep the box from starting to smell).
- ❖ Line the inside of the box with the garbage bag, and fold bag over the sides of the box.
- ❖ Have the kids rip their newspaper up into strips, and place it in the box until it’s about 2/3 full.
- ❖ Have the kids sprinkle a spade-full of soil over the top of the newspaper (feel free to include dry leaves or yard clippings with the soil).
- ❖ Have the kids sprinkle the newspaper and soil with a watering can until slightly damp (make sure there isn’t water pooling at the bottom of the bin though).
- ❖ Bring out the WORMS! Give each child about 20 red worms (a handful) and have them put them in their boxes. Let them play and watch the worms.
- ❖ Talk about what worms need to live and how to take care of their new worm composting bins, reviewing what they learned from the composting books:

What do worms need to live?

Worms need food, water, air, and shelter, just like us. Make sure there is always a cover of bedding (newspaper) over the worms. Sunlight is actually poisonous to worms, so they need something to protect them from the light. Bury your food scraps under the newspaper bedding, rotating around the box each time. If you get all the way around the box back to where you started, and the food is still there, stop feeding the worms for a couple weeks to give them time to eat what they already have (otherwise your bin will start to smell!). Make sure you look at your feeding sheet, and only put in the foods that worms like.



Keep the bin damp by adding water when the newspaper starts to dry out, or dry bedding if the bin is too wet. If your bin attracts a lot of fruit flies, try adding more soil to cover up the food and keep the flies out.

- ❖ Tell the kids about backyard composting, and how to harvest their compost to use to grow flowers and vegetables. Encourage them to compost at home, and give them composting information to take home.

After a couple of months, when the bin has lots of castings (worm compost), you can scoop it from the box worms and all, and use it in your garden or potted plants. If you want to keep most of your worms in the bin, push all the contents to one side, and add fresh bedding and start adding all new food only to that side. After a couple weeks, most of the worms will have migrated to the fresh side of the bin, and you can harvest the castings from the other side. Another way is to dump all the contents of the bin into a pile on a tarp out in the sun. The worms will burrow down into the pile, and you can scoop compost off the top. When you get close to the bottom, it will be mostly worms, and you can return this to the bin and add fresh bedding to start the whole process again!

If your worm bin isn't big enough for all of your food scraps, you might want to ask your parents if you can start a compost pile in the backyard. With a bigger bin or pile, you can compost all of your food scraps, leaves, and yard clippings (without worms), and have more compost to use on your lawn or in your garden.

Remember, composting is a form of recycling: it helps the environment by decreasing the amount of trash that goes to the landfill, saves your family money, and helps your garden by adding nutrients to your soil!



Additional Activities:

Gather other books on composting, gardening, worms, biodegradation, etc. for the kids to look at or check out (see the attached list).

If you have a computer with Internet service available, you can let the kids explore these worm and composting sites geared toward kids:

<http://www.urbanext.uiuc.edu/worms/> “The Adventures of Herman”

<http://www.pcnjwaste.com/WiggPuzz.htm> “Wiggles the Worm”

<http://www.cce.cornell.edu/tompkins/ithacachildrengarden/worm.html> “The Wonderful World of Worms and Composting”

For more info go to: <http://www.anr.state.vt.us/dec/wastediv/compost/main2.htm>
or call the VT ANR Recycling Hotline: 1-800-932-7100

Suggested Books:

The following is a list of books for children relating to composting, worms, gardening and garbage. You can use these as read aloud books during the workshop, or put them on display for the children to look at and check out.

Activities in the Earth Sciences

Helen J. Challand, Ph.D.,
Childrens Press, Chicago, IL

Adventures in the Underworld; Book One, Herma Builds a Tunnel

Anna Scott Droper.
Dunville, ON:Terra Publishing, 1988

The Amazing Earthworm

Lilo Hess.
New York: Scribner, 1979

The Amazing Dirt Book

Paulette Bourgeois.
Addison-Wesley, 1996, New York, NY

Annelida the Wonder Worm

Katie Diepenbrock.
Berkeley: Sagittarian Press, 1991

Compost!:growing gardens from your
garbage

Linda Brookfield
Conn. : Millbrook Press, c1996

The compost heap.

Rockwell, Harlow.
Garden City, N.Y., Doubleday [1974]

Compost Critters

Bianca Lavies.
New York: Dutton Children's Books,
Division of Penguin, 1993

Composting in the classroom : scientific inquiry for high school students

Nancy M. Trautmann, Marianne E. Krasny.

Dear Garbage Man

Gene Zion.
New York: Harper Collins, 1988

Discovering Worms

Jennifer Coldrey.
New York: Bookwright Press, 1986

Earth (Eyewitness Science Series)

Susanna Van Rose
Dorling Kindersley Publishing Inc.,
1994, New York, NY

Earthworms

Keith Pigdon and Marilyn Woolley.
Cleveland/Toronto: Modern Curriculum
Press, 1989

Earthworms, Dirt and Rotten Leaves;

An Explanation in Ecology

Molly McLaughlin.
New York: Atheneum, 1986

The Fall of Freddie the Leaf

Leo Buscaglia.
New York: Slack Inc., 1982

Garbage Delight

Dennis Lee.
Toronto: MacMillan, 1977

Give Peas a Chance; Organic Gardening Cartoon-Science

Peter Barbarow.
Happy Camp, CA: Naturegraph
Publishers, 1990

A Handful of Soil
Seymour Simon
Hawthorn Books, Inc New York, NY, 1970

The Hidden World; Life Under a Rock
Lawrence Pringle.
New York: MacMillan, 1977

In a Pumpkin Shell
Jennifer Storey Gillis.
Pownal, VT: Storey Publishing, 1992

Inch by Inch
Leo Lionni.
New York: Astor-Honor, 1962

Incredible Earth-Insider DK Guides
Nick Clifford
Dorling Kindersley Publishing Inc., 1996,
New York, NY

Kids Gardening; A Guide to Messing
Around in the Dirt
Kevin Raftery & Kim Gilbert Raftery.
Palo Alto, CA: Klutz Press, 1989

The Kids Nature Book :365 Indoor/Outdoor
Activities and Experiences
Susan Milord
Williamson Publishing Co., Charlotte, VT

Let's Compost
Nancy Hansen.
Calgary: Alberta Ecotrust, 1994

Lots of Rot
Vicki Cobb.
New York: J.B. Lippincott, 1981

P3,The Earth Based Magazine for Kids
PO Box 52,
Montgomery, Vermont 05470

Pee Wee and the Magical Compost Heap
Lorraine Roulston
Recycling Council of Ontario, 1992

Re-cycles
Michael Elsohn Ross
Brookfield, Conn.: Millbrook Press,
2002.

Scholastic's The Magic School Bus
Meets The Rot Squad: A Book About
Decomposition.
Beech, Linda.

Squirmy Wormy Composters
Bobby Kalman & Janine Shaub
New York: Crabtree Publishing Co., 1992

A Toothy Tongue and One Long Foot;
Nature Activities for Kids
Diane Swanson.
Vancouver: Whitecap Books, 1992

Twist, Wiggle and Squirm; A Book
About Earth Worms
Lawrence Pringle.
New York: Crowell, 1973

Worms Eat My Garbage
Mary Appelhof Flower Press, 1982,
Kalamazoo, MI

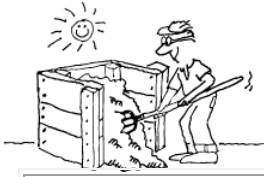
Worms Eat Our Garbage; Classroom
Activities for a Better Environment
Mary Appelhof, Mary Francis Fenton and
Barbara Harris.
Flower Press, 1993, Kalamazoo, MI

The Wump World
Bill Peet. Boston:
Houghton Mifflin, 1970

Zebo and the Dirty Planet
Kim Fernandes.
Toronto: Annick Press, 1991.

Name _____

Date _____



CELEBRATE COMPOSTING!

Find each of the following words:

FOODSCRAPS

CASTINGS

OXYGEN

BEDDING

PEELS

WORMS

GARBAGE

RECYCLE

LANDFILL

DECOMPOSE

WASTE

FLOWER

AEROBIC

DIGESTION

GARDEN

ORGANIC

COMPOST

BIN

REDUCE

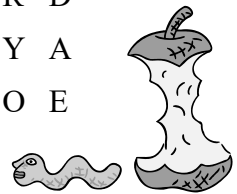
FERTILIZER

FRUITFLY

ROT

SOIL

E A I S N B I R L D E C O M P O S E A D T D Y
E W A S T E X A O L E E S G R I S O I F D E E
D D B I G E R Y E I I E A R A M S G G D N L L
T N I L E P I I L O L F E Y O C E O O O N C R
L E E F L O W E R R N Z D M N S L C A L E Y O
O G O Y R E D U C E I G G N T E E D I B D C E
R Y I E W O R M S L O E Y I A R S O E Y R E C
T X T L S E E C I D E I O F S L S D Y L A R E
Y O R T O S O T C S N N D D E M D L S S G T C
A M O Y E P R R L L C A M C W I W R G O C W O
S N D A N E O E L G T C Y R N A Z W N C I D R
L U N O F R E O R O T R F G S C O A I O N A E
M O F L O P C O M P O S T R E B I N T R A C L
E G A R B A G E E F O O D S C R A P S W G I S
I S O R R D P P A E R O B I C F R D A R R F A
T N F L O F R U I T F L Y C F A E F C A O R D
C T S S Y G E Y O E E I I U O R A R E E I Y A
O F D O L E T E P I S E W U N A M L P T S O E



Compost is Fun! Composting Words

Words can be found down, across, diagonal and backwards.

G	C	I	N	A	G	R	O	K	T	R	E	E	S	A
R	N	M	A	T	U	R	E	A	S	C	H	T	N	O
O	G	I	K	L	L	A	M	S	E	O	I	R	E	D
W	R	X	T	U	R	F	N	U	T	R	D	I	G	W
W	E	E	D	S	E	E	D	S	S	K	I	M	O	O
M	E	O	G	E	O	R	G	A	N	I	S	M	H	R
R	N	I	T	A	E	P	B	R	O	W	N	S	T	M
I	S	A	E	T	A	E	M	A	M	E	N	D	A	B
O	I	U	N	T	N	E	G	O	R	T	I	N	P	I
C	O	N	T	A	I	N	E	R	C	A	R	B	O	N
U	X	F	E	Z	I	S	E	L	C	I	T	R	A	P
R	Y	U	Q	W	S	E	R	U	N	A	M	U	H	L
E	G	Y	D	O	O	W	I	G	G	L	E	R	S	O
L	E	V	A	R	G	O	S	D	N	A	L	T	E	W
L	N	Y	T	I	L	A	U	Q	R	E	T	A	W	V

These 37 words are hidden in the box above:

TEA
GREENS
BROWNS
CARBON
NITROGEN
WORM BIN
ORGANISM
VERMICOMPOSTING
TURF
RED
WIGGLERS
MATURE
WOODY

TREES
GRAVEL
SOD
WATER QUALITY
pH
PARTICLE SIZE
TEST
STIR
MEAT
WEED SEEDS
OXYGEN
MANURE
PLOW

AMEND
WETLANDS
PATHOGENS
ORGANIC
HOT
COIR
CURE
GROW
PEAT
SMALL
CONTAINER
MIX

Caring For Your Worms Take Home Sheet

Maintaining Your Worm Bin

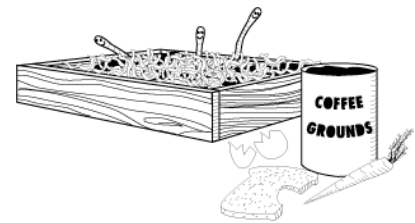
Red worms can eat ½ to 1 times their own weight in food each day, so add food scraps according to how many worms you have. The smaller the food scraps, the faster the worms will digest them, so try breaking up large items, like whole apples, before adding them to the bin. To avoid fruit flies and odors, always bury food under the bedding, keeping a 4" to 6" layer of bedding over the worms and food in your bin. Add fresh bedding every 1-3 weeks. Don't dump and run! Keep bedding as moist as a wrung-out sponge, adding water when necessary. Add dry bedding to absorb excess moisture. Remember that worms are allergic to sunlight, so keep the lid on!

Do Compost	Don't Compost
Vegetable scraps	Meat, fish or poultry
Fruit rinds & peelings	Bones
Bread, grains & pasta	Dairy products
Tea bags	Greasy or oily foods
Crushed eggshells	Dog and cat waste
Coffee grounds and filters	Non-organic materials
Paper napkins	i.e. plastic, metal, glass

Harvesting and Using Worm Compost

Harvest worm compost at least once each year to keep your worms healthy. You can start harvesting 2-3 months after you set up your bin. Simply reach in and scoop out the brown crumbly compost; worms and all. You can also move the contents of your bin to one side, place fresh bedding and a handful of soil in the empty space and bury food there for a month or two. Harvest the other side after the worms have migrated to the new food and bedding.

Using worm compost will help your plants thrive by adding nutrients and humus to the soil. Sprinkle a 1/4" to 1" layer at the base of indoor or outdoor plants, or blend no more than 20% worm compost into potting mix or garden soil.



PROBLEMS	CAUSES	SOLUTIONS
Worms are dying, disappearing, or crawling out of the bin	Food and bedding all eaten	Harvest compost, add fresh bedding and food
	Too dry	Add water until slightly damp
	Extreme temperatures	Move bin so temp. is between 40-80 degrees F (ideally 60-70 degrees)
Bin attracts flies and/or smells bad	Too acidic	Remove citrus scraps, add ¼ cup baking soda
	Food exposed/overfeeding	Add 4"-6" layer of soil or bedding & stop feeding for 2-3 weeks
	Non-compostables present	Remove meat, pet feces, plastic, metal, etc:
Sowbugs, beetles in bin	These are good for your worm compost!	

For more info go to: <http://www.anr.state.vt.us/compost>
or call the VT ANR Compost Hotline: 1-800-932-7100

MORE COMPOST POETRY

This Compost

By [Walt Whitman](#) 1819-1892

Something startles me where I thought I was safest,
I withdraw from the still woods I loved,
I will not go now on the pastures to walk,
I will not strip the clothes from my body to meet my lover the sea,
I will not touch my flesh to the earth as to other flesh to renew me.

O how can it be that the ground itself does not sicken?
How can you be alive you growths of spring?
How can you furnish health you blood of herbs, roots, orchards,
grain?
Are they not continually putting distemper'd corpses within you?
Is not every continent work'd over and over with sour dead?

Where have you disposed of their carcasses?
Those drunkards and gluttons of so many generations?
Where have you drawn off all the foul liquid and meat?
I do not see any of it upon you to-day, or perhaps I am deceiv'd,
I will run a furrow with my plough, I will press my spade through
the sod and turn it up underneath,
I am sure I shall expose some of the foul meat.

2.
Behold this compost! behold it well!
Perhaps every mite has once form'd part of a sick person--yet
behold!
The grass of spring covers the prairies,
The bean bursts noiselessly through the mould in the garden,
The delicate spear of the onion pierces upward,
The apple-buds cluster together on the apple-branches,
The resurrection of the wheat appears with pale visage out of its
graves,
The tinge awakes over the willow-tree and the mulberry-tree,
The he-birds carol mornings and evenings while the she-birds sit
on their nests,

The young of poultry break through the hatch'd eggs,
The new-born of animals appear, the calf is dropt from the cow,
the colt from the mare,
Out of its little hill faithfully rise the potato's dark green leaves,
Out of its hill rises the yellow maize-stalk, the lilacs bloom in
the dooryards,
The summer growth is innocent and disdainful above all those
strata of sour dead.
What chemistry!
That the winds are really not infectious,
That this is no cheat, this transparent green-wash of the sea which
is so amorous after me,
That it is safe to allow it to lick my naked body all over with its
tongues,
That it will not endanger me with the fevers that have deposited
themselves in it,
That all is clean forever and forever,
That the cool drink from the well tastes so good,
That blackberries are so flavorful and juicy,
That the fruits of the apple-orchard and the orange-orchard, that
melons, grapes, peaches, plums, will none of them poison me,
That when I recline on the grass I do not catch any disease,
Though probably every spear of grass rises out of what was once
catching disease.

Now I am terrified at the Earth, it is that calm and patient,
It grows such sweet things out of such corruptions,
It turns harmless and stainless on its axis, with such endless
successions of diseas'd corpses,
It distills such exquisite winds out of such infused fetor,
It renews with such unwitting looks its prodigal, annual,
sumptuous crops,
It gives such divine materials to men, and accepts such leavings
from them at last.