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RECYCLING  
WITH  
WORMS

**STUDY GUIDE**

by Michael Sinkinson,  
Bullfrog Films

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Video Produced and Written by Carlton Parfitt  
Edited and Directed by Joshua Green  
East-West Food for All Foundation

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## Credits

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### **RECYCLING WITH WORMS**

An 11-minute Video  
Produced and Written by Carlton Parfitt  
Available from:  
**Bullfrog Films**  
Oley, PA 19547  
(800) 543-3764

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# RECYCLING WITH WORMS

Produced and Written by Carlton Parfitt  
Edited and Directed by Joshua Green

## OBJECTIVE

After viewing the film and participating in chosen activities, students will be able to construct a worm bin and cite at least two advantages of recycling organic garbage in a worm bin rather than throwing it away.

## BACKGROUND

The growth in population has created more garbage. We need to find solutions to the problems that this overflow of garbage has created. There are three main techniques for solving the garbage problem: burying garbage in landfills, burning it, and recycling it. One recycling solution, "vermicomposting" (a method for disposing of organic food waste using worm bins) is a positive, concrete solution that allows individuals and small groups to become involved in this important issue.

## SYNOPSIS

Krista and her friends explain the advantages of using a worm bin to recycle leftover household organic material. To use a worm bin you need to keep organic household garbage in a small container, and every few days feed it to the worms in the bin. The worms produce a material called "worm castings", a rich, dark brown soil perfect for fertilizing gardens or houseplants. You can create a worm bin with something the size of a picnic cooler. Krista gives the viewers instructions for making a small worm bin.

## ACTIVITIES

### *Before Viewing:*

1. Ask the students if anyone recycles his or her non-organic garbage. What do they recycle, how do they do it, where does it go, why do they do it? Ask if anyone recycles organic garbage, such as in a compost pile or by feeding it to livestock. Ask the students if anyone has any comments he or she would like to make as a result of these findings. Record the students' observations and comments.
2. Show the students photographs of various types of earthworms and sea worms. Discuss the similarities and differences between worms and snakes. Discuss feelings that students have about handling worms. Have any of them experienced holding a live worm, such as when they were fishing or working in a garden? How did they feel? Ask if any of them know of Lowly Worm, a popular Richard Scarry character. Do they think of Lowly when they think of earthworms?
3. Create a diagram showing "The Voyage of a Potato Peel" or other type of common organic garbage. Follow the potato from seed to peel, including the disposal of the peel. If the homes in your community have garbage disposals, find out what happens to the food waste that goes down the drain. Include this information as part of your diagram. (In preparation for activity #2 in the "After Viewing" section, it would be good to hang drawings of this voyage from a piece of yarn, stretching the yarn into a straight line.)
4. As a homework assignment, have each student bring in

one night's organic garbage in a double plastic bag (e.g., two bread bags together) to prevent leakage. Empty all of the garbage into one large plastic container and weigh the sum of all the students' garbage for one night. Record this sum. Then multiply the sum by 7, to find one week's total. Next, multiply that sum by 4 to find the total for a month. Then find the total for a year. Divide the final total by the number of students in the class to find the average amount of organic garbage each family produces in one year. Make a graph to create a visual impact that shows the huge amount of garbage produced in this classroom alone. If the students show an interest in this, multiply the average weight of garbage for this class by the number of students in the school; by the US population, etc.

5. As a homework assignment, each student should interview at least 3 people outside the classroom, asking two questions: "Do you know what a "worm bin" is? What do you think a "worm bin" would be used for?" Share the results of the interviews before viewing the film.

#### *After Viewing:*

1. Each student, or the class as a whole, should edit the diagram made in pre-viewing activity #4. Instead of having the peel go into a trashcan or garbage disposal, show it going into the worm bin. Can they then make the diagram into a circular rather than linear diagram (i.e., connect the end with the beginning)? Which diagram shows the most sensible method of disposal? The students should explain why they think one method of disposal is better than the other.

2. Write a class op-ed article for the school newspaper or a "pretend" newspaper. They should explain the advantages of worm bins to the community. (Alternative writing assignment: write an advertisement for their Castings Co-op - see activity #4.)

3. Make a worm bin for your class.

### **How to Build a Worm Bin**

You will need the following materials:

- 1) a rectangular plastic container, approximately 18" high, 18" wide, and 9" deep.
- 2) a lid for the top of the container, which needs to be big compared to the height of the container (i.e., a round container won't do).
- 3) holes cut into the lid and covered with a plastic mesh - the worms need air.
- 4) at least 6" of clean moist soil or organic bedding.
- 5) one half pound (about 700) red wiggler worms. These may be ordered from a worm farm, and may also be found in baitshops.

In addition to the materials needed for making the worm bin, you'll need to begin to collect organic scraps from cooking or meals. The scraps could be saved in a covered plastic container, which can be kept on the kitchen counter. These scraps should be fed to the worms every couple of days. Bury the scraps a few inches deep in a corner of the bin. Cover the scraps with some of the bedding to prevent smells. You can use rubber gloves to help keep your hands clean. Most of the scraps will be eaten within a week. As the worms "process" the garbage it will be converted into

worm castings. When the worm bin begins to fill up, some of the bedding (which now contains an abundance of castings) can be used as fertilizer on gardens or around plants. Not only will you have a rich fertilizer, but you will also have red wiggler babies which can be given to friends or other classes. Then they can start their own worm bins! As Krista's friend Simon points out, with a worm bin there is no smell, no noise, no work; you get fertilizer and worms; and reduce your garbage by 30%! (The Resources section contains addresses of places from which worm bin kits may be ordered.)

4. Create a classroom "Castings Co-op". Whoever brings in scraps for the worm bin can get castings. This co-op may include others in the school - custodian, principal, other teachers, other parents. There are many avenues of exciting classroom activity that a project such as this can lead to, such as determining what is a fair return for the participants; if others who don't give scraps can buy castings or worms; etc. The opportunities for relating this film to other curriculum areas, as well as problem-solving in a community environment, are endless!

## GLOSSARY

**Bin** Another name for a container, as in "trash bin".

**Compost** (n.) A rich organic material created by mixing together a variety of organic materials (grass clippings, leaves, kitchen garbage, etc.) and allowing it to decompose. Compost can be used as fertilizer or mulch on gardens or plants.

(v.) To mix organic materials so as to create compost.

**Humus** A rich organic plant food, resulting from composting.

**Landfill** A place where trash is taken to be buried.

**Organic** Materials that come from nature.

**Per Cent** Mathematical term used to compare items in a group, using 100 per cent to represent the total of all items. For example, in a group of trash, 30 per cent may be organic materials and 70 per cent may be non-organic.

**Recycle** To use material which might have become trash and make it into something that can be used again. For example, plastic milk bottles are recycled into polypropylene fabrics.

**Red Wigglers** Best type of earthworm to use in worm bins.

**Vermicomposter** Technical term for "worm bin".

**Worm Bin** Covered, vented container which houses several worms in a moist organic bedding. The worms convert organic food waste to worm castings (fertilizer).

**Worm Castings** End product of the worm's digestive system.

**Zed** Canadian and British pronunciation of the letter "Z".



## RESOURCES

I. Questions or comments about worm bins can be directed to:

**EnviroKids**

**P.O. Box 4366**

**Vancouver, BC**

**Canada V6B 3Z7**

II. Closing the Loop: Integrated Waste Management Activities for School and Home (K-12 Edition)

A School Based Waste Minimization and Education Program

A hands-on, problem-centered, practical and adaptable program of activities designed to demonstrate the consequences of our actions on the environment.

**The Institute for Environmental Education**

**18554 Haskins Road**

**Chagrin Falls, OH 44022-1823**

(216) 543-7303 FAX (216) 543-7160

III. Annelida the Wonder Worm Grades 1-4

Katie B. Diepenbrock, author.

This 30 page, soft-covered book is being sold for \$5.00 post-paid as a fund raiser for the following non-profit publication:

**Worm Digest**

**Box 544**

**Eugene, OR 97740**

Orders along with payment should be sent to them.

One-year subscription to Worm Digest: \$8.00

for four issues.

Subscriptions to Worm Digest can also be ordered from  
**Edible Cities Resource Center**  
**Box 544-TTC**  
**Eugene, OR 97440-9998**

IV. The following materials are available from:  
**Creative Learning Systems, Inc.**  
**800-458-2880**

1. Worms Eat Our Garbage: Classroom Activities for a Better Environment Ages 9-14

Pages can be photocopied for classroom use.

2. Worms Eat My Garbage Ages 14 to Adult

Book about vermicomposting.

3. Worm Acres: A Composting Kit for Kids Ages 6-14

Everything you need to begin a worm bin, including a free coupon for 250 worms.

4. Worm Vue Wonders Ages 4,14

Double-sided viewing unit, guide for live action experiments.

V. Teachers who have access to the Internet can “surf” the World Wide Web using “Earthworms”, “Vermiculture”, “Worm Bin”, or “Worms” as search terms. There are several sites on the Web, including:

[http://www.howtocompost.org/info/info\\_wormfaq.asp](http://www.howtocompost.org/info/info_wormfaq.asp)  
(Earthworm FAQ)

<http://www.vermico.com/>  
(VermiCo)

<http://www.howtocompost.org/>  
(Composting)

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## Related Bullfrog Titles

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### **RECYCLING IS FUN!**

*12 minutes*

*Grades K-4*

Three captivating young children explore the three Rs of recycling - reduce, recycle, reuse. They visit a landfill, a recycling center, and their local supermarket to find out what they can do to help with our solid waste crisis.

### **ORGANIC GARDENING: COMPOSTING**

*10 minutes*

*Grades 3-Adult*

The experts at Organic Gardening magazine show how to make free fertilizer from kitchen and other organic wastes.

### **THE WHITE HOLE**

*10 minutes*

*Grades 5-Adult*

An amusing animated commentary on our throw-away society. There is no "away."

### **THE TRASH TROLL**

*13 minutes*

*Grades K-4*

An uplifting call to action for young students everywhere. A gruff, environmentally conscious gnome admonishes three children for carelessly littering his beach with a plastic six-pack ring.

### **OWL/TV: SERIES IV**

*29 minutes per program*

*Grades 2-7*

Series IV (Programs 31-40) emphasizes environmental action: recycling, composting, avoiding waste.

### **IT'S GOTTEN ROTTEN**

*20 minutes*

*Grades 7-12*

Science of the composting process. Students experiment with composting techniques in the classroom and in an urban community garden. Using powerful microscopes they examine tiny composting organisms.

For other related titles please see our Web Page  
[www.bullfrogfilms.com](http://www.bullfrogfilms.com)

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