Memorial University of Newfoundland (MUN) Botanical Garden
Compost Curriculum Unit

"Every time you throw away leftover food, somewhere...there is a hungry worm, and a landfill that's full" Brian Paley

INTRODUCTION

Welcome to the world of composting! By using the activities in this curriculum unit, you will join other teachers around the province of Newfoundland and Labrador as they bring compost into the classroom as a valuable teaching tool. The activities are hands-on and encourage student exploration and learning. They can also be used to teach subjects across the curriculum.

Composting is a great teaching tool to introduce and explain concepts such as life cycles, decomposition, soil, and recycling, just to name a few. Composting is a way in which people use the natural process of decay to produce a rich, fertile soil.

Composting is also fun! Students will get to touch dirt, hold worms, build compost piles, set-up and explore worm bins, analyze what they've eaten for lunch, and plant seeds. While doing all of this, children learn a new appreciation of natural cycles and resources, and the importance of respecting our environment.

BACKGROUND INFORMATION

The following compost unit was initially researched and developed by Garden staff during the 2003 Junior Naturalist Camp Program. Funding for this education program was provided by MMSB through the Newfoundland and Labrador Waste Management Trust Fund. This and other compost education programs, including information leaflets and children's activity sheets have been developed to increase public awareness and acceptance of composting, waste reduction and other environmental stewardship practices.

The Junior Naturalist Camps, which operated at MUN Botanical Garden during the summer of 2003, provided nature and garden experiences to children aged 5 to 10 years. Concepts and activities developed during this time were applied further to a variety of Garden programs and special events including the curriculum-based school program, the Sunday Family Day Program, the Fall Parent & Tot Program, 5thAnnual Potato Festival, and the Newfoundland Horticultural Society Flower & Vegetable Show, to name a few. The compost information leaflets produced in 2003 were distributed to program participants and visitors to the Garden throughout the season. In 2004, we extended these concepts into the spring and fall programs.

Even though development of this program is ongoing, educators are encouraged to use and incorporate the compost information leaflets and children's activities' into existing programs. Please note, the curriculum links to primary, elementary, intermediate and secondary school programs were further developed in 2004, in particular to the concepts of life cycles and soils in the primary grades; habitat studies, reproduction and food chains in the elementary grades; the role of decomposition in ecology and survival of various ecosystems at the intermediate level; as well as soil composition and trophic levels at the high school level.

Coming Soon:
The Compost Challenge Club. Please contact the Garden for further details or keep checking the website for updates.

OBJECTIVES OF THE COMPOST PROGRAM:

Create and promote a sense of environmental stewardship

Understand the importance of waste reduction

Learn how to actively reduce waste at home, school and in the community

Encourage student exploration and learning (scientific investigation)

Understand the basic biological processes involved in decomposition

Appreciate the beauty and fragility of our natural world

Understand the differences and similarities in local Newfoundland biomes (i.e. northern boreal forest, barrens, freshwater, and wetlands) and the role of decomposition in their ecology and survival

Introduce students to concepts such as:

-decomposition
-soil development
-natural recycling

Learn about worms and their role in nature

Learn how to set up, maintain and use a vermicomposter

AN INTRODUCTION TO COMPOSTING

To begin the compost unit, brainstorm with students about composting. Ask students to explain what composting is. Allow a few minutes for students to discuss. This will help get a sense of what students already know. For younger students, teachers may want to spend a few minutes talking about recycling and the kinds of things that can be recycled. Proceed to tell them that composting is nature's way of recycling. Composting is a way in which people use the natural process of decay (decomposition) to produce a rich, fertile soil called humus. For younger students, tell them composting is a way in which we can make new soil from much of the garbage that we have in our home. Tell them soil is very important for growing healthy plants and vegetables.

Ask students to think about how composting might help the earth. Older students might suggest the following: it helps to reduce the amount of waste material that end up in our landfills; and it provides rich, fertile soil that is very useful for gardening, landscaping, or house plants. Younger students might suggest that the more we compost, the less garbage we will have. Compost also puts important nutrients back into the soil. It makes the earth richer and helps plants grow.

COMPOST RECIPE

Tell students that much of the garbage that we throw out everyday is "organic material". Explain to students that organic materials consist of anything that is or once was living or was produced by a living organism such as a plant or tree. Begin to make a list of all the things that can be composted. Write these on the chalkboard. Some examples include the following:

Apples and apple peels	Bananas and peels	Berries
Bread	Celery tops	Carrot tops / scrapings
Coffee grounds/filter	Grapes	Potato
Tea leaves and tea bags	Feathers	Flowers
Plant trimmings	Leaves	Shredded paper
Sawdust	Seaweed	Grass clippings

For a more detailed list, please refer to the **Compost Information Leaflet#2**.

Tell students that it is easiest to build a compost pile by layering the ingredients. We can group items together as "greens" and "browns".

Explain that "browns" include the dead, dried plant parts such as leaves. These materials are high in the element carbon which provides a source of energy for the decomposing organisms living in the compost pile.

"Greens" are the fresh, living parts like grass clippings, fruit and vegetable peelings. These are high in the element nitrogen which is important for the growth and reproduction of the decomposing organisms. Divide the compiled list into "greens" and "browns".

Next, have students make a list of things that cannot be composted. Do not compost meat, fats and dairy products. Some examples of things not to compost may include:

Butter	Mayonnaise	Vegetable oil
Meat scraps	Milk	Chicken
Yogurt	Cheese	Fish scraps
Pop cans	Glass bottles	Plastic

Can any of these items be recycled or reused in another way? Ask why it is not a good idea to compost things such as fish bones or meat products.

Other animals may try to dig it up and some products, because of their smell, will attract rodents, flies and other pests.

COMPOST IT!

The objective of this game is for students to come up with as many compost items as possible.

To start the game, have students stand in a circle. Choose a student to start the game or the teacher can start. This student or teacher becomes "IT" or the "WORM". The student must call out a student's name and something that can be composted beginning with the first letter of that student's name ("Brittany, Banana Peel"). The student may then sit down, and the student named becomes "It" or the "Worm", and must call out another student's name and continue in the same fashion, calling out compostable material until all students are sitting down.

COMPOST HIKE!

Arrange to take students on a walk in the woods, through a meadow, near a pond, or through any natural area. "**Going On A Nature Walk With Children**" will help you prepare for a successful walk. Take along the digital camera if you have one. Also bring along a bag to collect 'people garbage'. It might be a good idea to have a clean- up of the area.

Compare nature's communities to our own. Look for things that will decay or compost in nature and things that may not.

Demonstrate that 'garbage' is produced in nature, particularly in the autumn when needles and leaves fall from deciduous trees, and perennials and annuals die back. Point out that even in summer, evergreen needles fall to the ground, animals die as do some trees and other plants. Yet, we never see nature's garbage accumulating or piling up, as in our own communities. Ask the children if they think some items (such as dead leaves) will compost faster than other items (such as tree trunks and branches). What will the dead leaves turn into?

Will rocks compost and disappear over time or will the same rocks be here in years to come?
Back in the classroom, have students make a list of things they found along their walk. Did you find garbage that may have been left there by other people? Students can write a journal entry to describe their walk.

TOSSING THE COMPOST
The objective of this game is to review materials that can and cannot be composted. Prior to playing this game, teachers will need to set up two containers per team. One container is labeled "Can Compost" while the other is labeled "Cannot Compost". Gather as much toy food as possible (large enough so that it can be tossed). Divide the amount of food equally among the two teams.
Have students divide into two teams. To make it interesting, have students decide on a name for their team (i.e., the Rotten Apple Cores). Have students stand in a line and one at a time they must decide which toy food gets tossed into which container. (i.e.,an apple tossed into the compost container, while the steak is tossed into the cannot compost container). If a student tosses a toy food into the wrong container or misses a container, they must take it back when they've tossed all their food, and pass it on to their team mate to try. The team who tosses all the food in the appropriate container first is the compost champion team.

GREENS OR BROWNS
Prior to this activity, the teacher will need to gather and laminate (if desired) a variety of pictures such as fruit, leaves, tea, coffee grounds, plants, pop cans, etc. Have students tell whether or not the item can be composted. If so, do they belong to the "green" or "brown" pile. The teacher can make a "green" and "brown" list on the board.
Another option is to have students find examples of things that can be composted by cutting out pictures from old supermarket flyers, newspapers, and / or magazines. Have students organize the pictures into a "green" or "brown" pile. One idea might be to divide the students into two groups: a "green" group and a "brown" group.

COMPOST BULLETIN BOARD
The objective of this activity is to have students share their knowledge of composting with other students and/or parents. Have students work together to create a compost bulletin board. Encourage students to be creative as they think about how to decorate their board to tell others about composting. Display the bulletin board on a wall outside the classroom or invite other students to come to your classroom to see the board. One idea is to divide the board into different sections, leaving space to teach about composting with worms.

GROWING GARDENS FROM YOUR GARBAGE

The children's story book, Compost! Growing Gardens From Your Garbage by Linda Glaser presents composting as an entertaining family activity. Beautifully illustrated by Anca Hariton, it provides a description of composting throughout the year, what it does, and how to best go about doing it. This picture book is primarily aimed at very young children, however, we have read it to children (and parents) of all ages.

This story may be read at any point during the composting education program. In fact, it can be effectively utilized throughout the program, particularly right before or after lunch, as it will help the children to think in terms of composting rather than tossing all lunch waste into the garbage.

Educators and parents may find this book useful in introducing composting into the classroom and home environment. Many adults commented that they found it very informative, without being intimidating or boring.

TURNING GARBAGE INTO COMPOST

Ask children to estimate how much food waste they produce each day. What happens to it? What ways can food waste and other waste be recycled? Encourage students to bring in snacks and lunches that can be composted. This will help students identify composting materials as well as promote healthy eating habits. Encourage students to keep any uneaten item that can be composted. A compost bucket for collection can be set up in the classroom, and emptied everyday after lunch.

Have students prepare a chart in their journal for each day of the week, and record the number of items that can be composted from their lunch everyday, for a one week period. At the end of the week, have students graph their results. Ask students the following questions:

-On what day did you compost most?
-On what day did you compost least?
-What item did you compost most?
-What items do you think will decompose more quickly? Why do you think so?

KEEPING TRACK OF YOUR LUNCH

Print the lunch worksheet and give a copy to each student. Ask students to describe their lunch indicating which, if any, of their lunch was compostable. Keep a list of items that were reusable or recyclable. How much of your lunch went to the local landfill? Make suggestions to "green" your lunch.

Students could continue this activity for a one week period, and compare their results from the beginning of the week to the end of the week. Were any changes made? How do you feel about making those changes?

COMPOST CONTAINERS

Discuss with children the various containers that can be used for composting. Tell them there are many types of containers that can be used ranging from very elaborate to very simple. Some of these include a wood and wire bin; a garbage can with the bottom removed and holes drilled in the sides; a rotating barrel composter; and a vermicomposting or worm bin. If possible arrange to visit a site such as MUN Botanical Garden where students can view the different types of containers.

FROM GARBAGE TO COMPOST

Begin a discussion about the process involved in making soil from compost materials. Tell students that tiny bacteria start to break down the organic matter. Sometimes we use decomposers such as worms to help with the process. This process of breaking down is called "decay" or "decomposition".

DECOMPOSER HUNT

Arrange to take students on a walk around the school grounds, in a park, or on a nature trail. Explore and look for decomposers that we can see such as mushrooms, carpenters, worms, and other insects. Remember if you collect insects, you must return them to their habitat.

How many different kinds of decomposers can you find? Are there decomposers we can't detect with the naked eye (i.e. bacteria, fungal spores, etc.)

Back at the classroom, ask the students "Does nature need garbage collections and a landfill? Why not?" Make the connection that if we followed nature's example and composted more, we would have less garbage to fill up the landfills. Can landfills get full? What do we do when this happens? Would you like to live next to a landfill? Why or why not?

Arrange to take the students to visit the nearest landfill if possible. Obtain the proper permits or other documents necessary to enter the site.

Have students design a poster to create an awareness of the importance of composting and the need to reduce garbage entering our landfills.

Obtain permission to start composting in your school. Don't forget to register in our upcoming Compost Challenge Club. See information on compost containers to help decide which container will work best for you. Teachers may consider composting with worms or vermicomposting. See the information leaflets on Vermicomposting for more details and how you can get started.

DIARY OF A WORM

Diary of a Worm by Doreen Cronin is an entertaining book about the life of a young worm growing up with family and friends. While children enjoy many silly aspects of the story, the message that worms are tiny, yet important friends to the earth is made very clear. This story not only fosters a sense of stewardship and caring for worms, but we found children requested it be read over and over. The illustrations by Harry Bliss form an integral and humerous part of the story. Reading this story before starting the vermicomposting activities and concepts is an excellent way to open the students' minds to accepting worms as creatures deserving our respect and hopefully encouraging curiosity and not revulsion with these little critters. While this book is intended for children, we found the parents enjoyed it as well.

WIGGLING WORMS AT WORK

Wiggling Worms at Work written by Wendy Pfeffer, and illustrated by Steve Jenkins is a great book to teach children about the life cycle of a worm and their habitat. It also illustrates why worms are important for humans and for plants. This book is a great way to introduce students to the worms in the vermicomposter.

WORM COMPOSTING

Worm composting or vermicomposting is using worms to recycle food scraps and other organic material into a valuable and nutrient-rich soil mixture called vermicompost, or worm compost. Worms eat food scraps, which become compost as they pass through the worm's body in the form of castings. This compost can then be used to grow plants.

VERMICOMPOSTING IN THE CLASSROOM

Ask what humans need to survive. Compare with what the students think worms need to survive. Worms need food, water (moisture), and air - just like humans. They also need darkness and warm temperatures. Teachers may want to review the requirements for a happy habitat at this point. Worms need a lot of care if we take them out of their natural habitat. Remind children that if we take worms from their home, we must be responsible for their survival. By starting a worm bin in the classroom, we are simulating the worm's role in nature. Though worms could eat any organic material, certain foods are better for the classroom worm bin.

A WORD ABOUT GOOD WORM STEWARDSHIP…

By removing worms from their natural habitat, we are taking responsibility for their care and well-being. Worms, like any creature kept in captivity, will die if neglected. Before starting your vermicomposting project, please ensure that everyone involved is ready to be a good worm steward!

Emphasize humane treatment at all times. Have a water bottle available so hands can be sprayed with water before handling these delicate creatures.

(Worms are sensitive to the salts and other substances found on our hands, even after washing). Children are very open to the concept of caring and providing for creatures, even worms. As with all living creatures and ecosystems, we find they easily relate to the concept that living things, including people have specific requirements in order to survive.

Use raw fruit and vegetable scraps to feed the worms. Try to use more vegetable matter as some citrus fruits, such as orange rinds, are too acidic to break down quickly, and could attract fruit flies. **It is important that food is buried deeply during the first feeding**. Vary the location of each additional feeding to avoid overloading the bin. It is also very important to chop food scraps very tiny so it is able to break down much faster. Remember worms do not have teeth!

SETTING UP THE WORM BIN

Setting up the worm bin is easy. The size of the container and the number of worms needed depends on the amount of waste added. Begin the worm bin with a mixture of soil and sand. This provides the worms with grit for their digestive systems. Fill the bin three-quarter's full with damp bedding, fluffed to create air spaces. The bedding can be made of newspaper strips which can hold moisture necessary for the worm's survival.

Add red wigglers. Red wigglers ("Eisenia fetida" and "Lumbricus rubellus") are the best worms for vermicomposing. They are much smaller and thinner than earthworms, and they do not seem to mind being kept in captivity. Sometimes these worms are called "redworms", "manure worms", or "trouters". Red wigglers will change waste into vermicompost within a few months. The compost is ready to be harvested (removal of the finished compost from the bin) when there is little original bedding left and the food scraps have been converted into brown, earthy-looking soil. The compost can be used immediately or stored for future use. We can mix it with garden soil to provide more nutrients for the plants or it can be used as a top dressing (mulch) for plant and vegetable beds.

Worms can be purchased from Trouter's Special Worm Farm, located in Bay Bulls, Newfoundland.

For more background information, please refer to the **Compost Information Leaflet #7.**

THE BIOLOGY OF WORMS

Worms can live up to about a year in a worm bin. Because the worm's body is about 90 percent water, if a worm dies in the worm bin, it will shrivel up and become part of the compost rather quickly.

WIGGLING WORMS WALL

In this research activity, have students find out about worms.
Describe the habitat of a worm (describe its home, what it eats) and describe the worm in terms of its physical features. How are worms adapted to living in winter, and why are worms important to people and plants are just a few things to find out about your worm. Don't forget to draw a picture of your worm.
Students can use the information to create a "Worm Wall" to celebrate what they found.
Older students could research the life cycle of the worm and its importance in nature. They can present their findings to the class in a presentation medium of their choice.

HOW WORMS REPRODUCE

Worms are hermaphrodites. This means they are both male and female at the same time. In order to mate, they still require two worms. The worms attach to each other for a few minutes, and several days later, a cocoon or egg case is formed. The cocoon eventually separates from the worm. Inside the cocoon, two to five baby worms may be found. The baby worms live in the egg case for at least three weeks, sometimes longer depending on the surrounding conditions. In the winter time, for example, baby worms may stay in the cocoon for many weeks until the temperature warms up again. When the baby worms eventually crawl out, they are the thickness of a piece of thread and about 1cm long. Usually the worm appears white, as they have not yet developed enough blood (pigmentation) to be seen. In two or three months, worms are mature.
Ask children if they think the worms are the only creatures living in the classroom worm bin. There are many different creatures that help break down organic matter to make compost. These animals are called microorganisms and decomposers. A compost pile or a worm bin will have lots of different bugs. Bacteria do most of the work, even though they are invisible to the eye. Other animals which are large enough to see such as beetles, worms, centipedes, millipedes and carpenters are also decomposers. They eat dead things, turn them into soil, and help new plants grow. Without decomposers, new plants would not have the necessary nutrients needed to grow.
These organisms are introduced to the bin from the skin of the worm and from soil added to the bedding. Added garbage introduces more organisms, including fungal and bacterial spores.

COMPOST EXPLORERS

In this exploratory activity, have students work in small groups. Each group will be given a pile of compost, and a toothpick for each student in the group. Tell students this compost used to be grass clippings, fruits, vegetable scraps, etc. Have students look through the compost and record any decomposers they find. Set up the microscope and have students look at various samples of compost. Did they find decomposers that they could not find with the naked eye? Summarize by restating the role and importance of decomposers.

Take the children outside to look for a second time for other 'composting critters'. What other kinds of decomposers can they find? Bring back soil samples from the nearby school yard and look for decomposers underneath the microscope. What did you find?

WORMS UP CLOSE AND PERSONAL

Observe the worms' reactions to light. Why do worms stay inside the covered worm bin? Worms do not have eyes, but they can sense light, especially at their front end. They move away from light and will become paralyzed if exposed to light for long periods of time. If a worm's skin dries out, it will die.

Observe the compost worms by using the magnifying box or glass. Ask children to note the following:

-What color is it?
-What shape is it?
-What does it feel like? (Remember to moisten hands before handling a worm)
-What does the top side / bottom side look like?
-Does it have eyes, ears, legs, nose, or mouth?
-Describe how it moves
-Why do you think they are important to life on earth?

WORM RESCUE

While worms need moisture to survive, too much moisture will kill them. Have you ever noticed worms on the sidewalk after a rainstorm? This could happen because the worms' homes in the soil become flooded, and they often come to the surface in search for less watery conditions. Also, they could be taking advantage of the wet conditions to travel above ground. Once on the pavement, worms often get disoriented and cannot find their way back to the soil. They then dry up and die when the sun comes out. After a heavy rainfall, go outside to look for worms. What should you do when you see the worms on the pavement? (Stepping on them is not the right answer)! Be a worm rescuer, and put them back in the soil where they belong and can survive.

Look for worms in garden soil, parking lots, etc. How many kinds of worms did you find? Where did you find the most worms? Make a graph that shows the number of worms found in each place. Students could further their research on worms by looking at worms from around the world.

For more background information, please refer to the Worm Watch Program

HOW DO WORMS HELP THE SOIL

Put worms into a glass container with soil. Cover the sides and top of the container, otherwise the worms will migrate away from the light. Every now and then uncover the worms to watch them make tunnels in the soil.

Put layers of different types of soil into the glass container and watch the worms mix the soil. In addition to making soil, worms are natural soil tillers. They mix layers of soil while producing tunnels in the soil to help air and water to reach the plant roots. Tiny feeler-like bristles, called setae, on the bottom of the worms help them move through the soil.

DESIGN A WORM

Have younger students design their own worm from materials such as play doh, modelling clay, crayons, markers, paints, yarn, construction paper, pipe cleaners or paper scraps, cotton balls, socks / stockings.

Ask students to write a story about their worm and share stories with other classmates.

COMPOST OR LANDFILL

Put some worm food in an air tight bag. Compare what happens to this food to what happens to food in a worm bin. Students should keep of daily record of what happens to the food in the bag. Many people mistakenly believe that garbage sent to landfills decomposes quickly, like it does in a worm bin or compost pile. However, this is not at all the case because the key ingredients of air and moisture are missing in a landfill environment. Additionally, worms and other important decomposers cannot live or function in such conditions.

POTENTIAL CROSS-CURRICULAR APPLICATIONS OF A WORM BIN FOR THE PRIMARY AND ELEMENTARY SCHOOL CLASSROOM

Language Arts:
-read / write stories about worms
-vocabulary development
-worm bin journals
-worm puppet shows
-create newsletter / information leaflet on worm composting
-research worms from around the world

Math:
-count worms
-measure and weigh worms, food scraps
-sort worms (by size, color, etc.)
-graph worm information such as population increase, amount of food eaten, number of worms found
-measure bin, three dimensional measuring, calculate area and volume (for older students)
-averages (how much food per day, week, month)

Science:
-worm anatomy
-worm needs and adaptations
-worm life cycle and reproduction
-scientific investigation
-organic / non organic
-decomposition
-classification and different species of worms
-identify other worm bin organisms (sow bugs, ants, centipedes)

Horticulture:
-soil composition
-compost, compost piles
-plant needs
-planting lessons and experiments (do plants grow better in compost?)

HARVESTING THE COMPOST

While reducing garbage is admirable in itself, activities that involve the 3 R's (re-use, recycle, reduce) are also fun and can help us become very creative. Composting, in particular, produces the soil we need to grow our plants.

FROM NEWSPAPER TO FLOWERPOTS

Invite children to make flower pots from old newspaper. Wrap several strips of newspaper around the bottom half of an old soda pop can. Fold in the bottom and tape together with masking tape. Remove the soda can and your pot is ready for planting. The newspaper pot can be planted right into the ground. Using the newspaper pot, transplant a few plants, seedlings, or seeds (beans or peas work best, as they tend to grow faster) in a potting mix with worm compost added. Transplant other plants or seeds into pure potting mix. Remember to label each one. Observe what plants grow the best, and try to explain why. One suggestion is that worm castings contain nitrogen and other nutrients necessary for plant growth. When added to soil, worm compost increases the nutrient value and improves the soil structure and drainage.

Encourage children to think about why plants are important to humans, insects and other animals.

A Compost Glossary

Aeration
Getting oxygen into the compost by mixing or turning

Bedding
Materials like newspaper and leaves used as an organic medium for worm composting

Browns
Carbon rich compostable materials which are usually dry

Carbon
The element which provides a source of energy for decomposing organisms.

Compost
The end result of the composting process or the process itself. Compost is a dark, rich soil conditioner known as humus which has been created through the biological reduction of organic matter

Composter
A container such as a bin or box used for composting

Compostable Materials
Organic materials that will break down in a compost bin

Composting
The biochemical process which occurs when organic matter is broken down by decomposer organisms into a nutrient rich soil conditioner called humus

Decay
To rot, break down or decompose

Decomposers
Organisms such as worms, bacteria and fungi that help break down organic matter

Decomposition
The process of breaking down organic matter into its basic elements including nutrients needed for plant growth. Decomposition occurs in nature and in controlled environments like compost bins.

Ecosystem
A mutually dependent system consisting of plant, animal life and inorganic matter.

Food Scraps
Generally refer to uncooked fruit and vegetable scraps or any compostable food materials.

Greens
Nitrogen rich compost materials (usually wet).

Habitat
A home for living creatures, including plants and animals.

Harvest
Removal of the finished compost for use as a soil conditioner

Heap
An unenclosed compost pile

Hermaphrodite
An organism possessing both male and female reproductive organs.

Humus
Finished compost, formed through the break down of plants and animal matter. Humus retains and slowly releases nutrients to plants.

Landfill
An area of land where waste is dumped.

Leaf Mold
Decomposed or mostly decomposed leaves.

Microorganisms
Organisms that cannot be seen without magnification such as bacteria and fungi.

Mulch
A layer of partially decomposed plant materials placed on top of garden beds and around plants and shrubs.

Nitrogen
An element important for growth and reproduction of decomposing organisms.

Organic Matter
Any organic material that is or once was living or was once produced by a living organism.

Red Worm
A variety of worm suitable for vermicomposting. The red wiggler is a red worm.

Screening
To sift out uncomposted matter from humus to create fine compost.

Soil
A combination of tiny rocks, sand, silt, clay, decomposers, and organic matter.

Vermicompost
The end product from composting with worms. Vermicompost contains worm castings, broken down organic matter, bedding, worm cocoons, worms and other organisms.

Vermicomposting
Composting with worms

Worm Bin
A container especially prepared for worms to live in and eat organic garbage. A vermicomposting system.

CHILDREN'S COMPOST BOOKS AND OTHER RESOURCES

Please Note: This list includes only the resources utilized by staff during the camp program and is not a complete list of the resources available. Recommendations are welcome and should be forwarded to the Education Coordinator.

CHILDREN'S BOOKS:

Compost! Growing Gardens From Your Garbage, Glaser, Linda.

Diary of a Worm, by Doreen Cronin

The Magic Box in My Backyard, Pollard Smith, Judy.

The Magic School Bus Meets the Rot Squad, Cole, Joanna.

Wiggling Worms at Work, Pfeffer, Wendy.

REFERENCES:

"Avalon Gardener: Home Composting Handbook"; St. John's Clean and Beautiful; St. John's, NL.

"Composting"; Cole, Trevor. Agriculture Canada.

“Composting Goes To School”, The Composting Council of Canada.

"Composting"; Waste Management Information Series; Environment Canada.

“Do The Rot Thing”, Alameda County Waste Management Authority.

"Getting Started With Composting"; Atlantic Resource Conversion Co-operative Ltd; Wolfville, Nova Scotia.

"Vermicomposting: How To Recycle Your Kitchen Wastes"; St. John's Clean and Beautiful; St. John's, NL.

WEBSITES:

MMSB (Multi-Materials Stewardship Board) www.mmsb.nf.ca/

Composting Council of Canada, www.compost.org/ (E-mail: info@compost.org)

Worm Watch: http://www.naturewatch.ca/english/wormwatch

RECOMMENDED MATERIALS

- Diary of a Worm, by Doreen Cronin
- Growing Gardens From Your Garbage, by Linda Glaser
- Laminated pictures (of what to compost or not)
- Activity sheets*
- Compost bucket
- Magnifying box / glasses
- Compost certificates*
- Old newspaper
- Plants, seedlings, or seeds (peas / beans)
- Masking tape
- Soda pop cans
- Potting mix / compost soil mixture
- Compost Information Leaflets #1-#7**
- Craft Supplies
- Wormwatch brochures

*available from MUN Botanical Garden
**available on the website