New Start Community Garden

Garden Curriculum

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NEW START COMMUNITY GARDEN

GARDEN CURRICULUM

The purpose of this curriculum is to provide educational materials to support student and community visitors to the New Start Community Garden, aka the Shark Garden. It is designed for ages 10 and up and many lessons and activities can be used at home as well as in the garden. Our goal is to create inclusive curriculum that encourages sustainable organic gardening, environmental stewardship, and multicultural appreciation for food. For more information about the Shark Garden, contact info@sharkgarden.org

Table of Contents

Vermicomposting

Fun fact: Food scraps, junk mail and paper products make-up about 30 percent of garbage and food waste. Okay, actual fun fact: There's an easy, and what some may even describe as fun, solution.

Worm composting, also known as vermicomposting, is a simple way to reduce household garbage, and it's possible to do whether you live in a tiny apartment or a large house! By layering your food scraps with dry materials like scrap paper and cardboard and adding the magic ingredient – red wiggler worms – and their waste (poop), known as vermi-casts, you can convert it into compost gold, while reducing your reliance on the landfills that are quickly filling up.

ITEMS YOU CAN COMPOST WITH YOUR WORMS:

- Food scraps (including things like melon rinds, roots, stems, leaves, cores, husks, seeds, skins, peels, etc.). Exceptions to this are listed below.
- Egg shells (but not whole eggs), seaweed and rinsed seashells (like oyster shells; not shrimp peels)
- Old natural fiber clothing (old t-shirts, socks, boxers, etc)
- Natural yarn, twine and string
- Non-glossy paper products (cardboard boxes, newspapers, magazine inserts, most junk mail, envelopes, etc)
- Tea leaves and bags (remove the staple!); coffee grinds and filters
- Dead plants, grass clippings, pine needles and leaves – just make sure they have not been sprayed with pesticides
- Natural non-treated wood and byproducts like wood ash, sawdust and shavings (no coal ash)

ITEMS YOU CANNOT COMPOST IN A WORM BIN:

- Lemon, lime, orange or other citrus peels and juice (in excess this will make the soil too acidic)
- Onions and garlic (a good rule of thumb is if it makes you smell, it makes your worm bin smell)
- Meat, fats, grease, bones or oils (no butter, lard, stocks, soups, etc)
- Plastics and plastic coated paper (like glossy magazines)
- Stickers, including veggie stickers (remove stamps from envelopes)
- Bread or yeast products (no crackers or cakes)
- Salt, pepper and other spices
- Milk, dairy or dairy products
- Cat or dog feces
- Diseased or infested plants
- Treated wood products

There are several resulting ingredients from vermicomposting including

Worm castings (otherwise known as Worm Poop)

Worm Compost (The broken down materials to add more benefits and optimal plant growth to garden)

Worm Tea (The juice that the process create that can be diluted in water for use as a liquid fertilizer)

Benefits of Vermicomposting

Now that we have discussed the meaning of vermicomposting and what items make an ideal, rich compost, let's discuss the benefits of utilizing worm compost.

Benefits of Vermicomposting:

Vermicomposting assists in processing food waste to keep the waste out of landfills and promotes a smaller carbon footprint.

Vermicomposting creates organic fertilizers in forms of worm castings (worm poop/waste), worm tea, and compost

Compared to traditional composting, vermicomposting requires less space and cost

The Worms do the work which means less work for us. The worms know how to get the job done and process compost with ease, meaning we have more time to focus on growing our garden produce and ingredients.

Red wiggler worms not only know how to produce nutrient rich compost, but they also eat twice their size in weight. So, you know what that means? Nutrient-dense poop too!

Vermicomposting: The Process

How Do You Vermicompost?

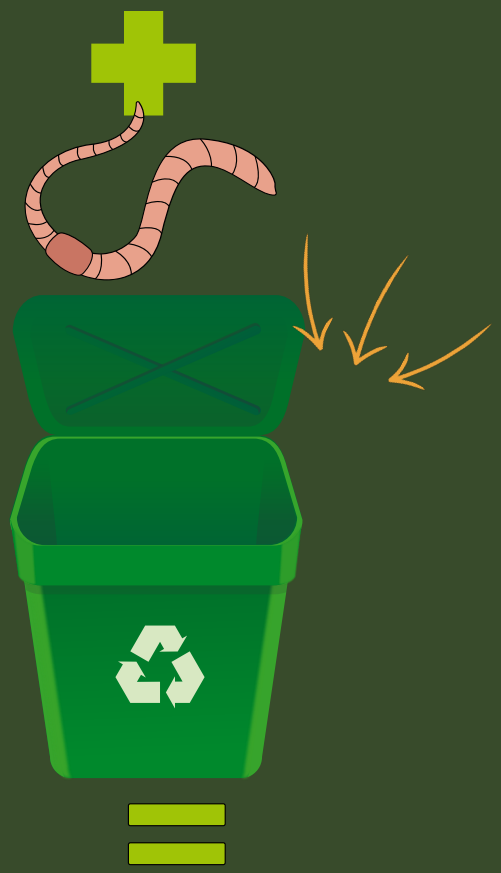
1. Make a dark house for the worms to live in. Two wooden or plastic bin or other non-metal container. A bin 1.5 feet high x 2 feet deep x 3 feet wide is a good size for a household. Make drain holes near the bottom and utilize other bin to catch "worm juice" or fertilizer.
2. Fill the bin with moist bedding. Bedding can be paper or newspaper shredded, leaves, straw, peat moss, or sawdust. Make sure the bedding is kept damp like a wet sponge. Change the bedding once or twice a year.
3. Feed the worms.
    a. Yes! Fruit, vegetables, coffee grounds, bread, leaves.
    b. No! Milk, oil, eggs, meat, fat, dog or cat feces.
4. Dig a hole in the bedding, dump the food in and cover it up with bedding. Pick a new spot each time you add food.
5. Keep them damp and warm by adding water to the bedding as needed. Add water if the bedding feels dry, but make sure the excess water can drain away. Cover the bin with plastic or a tarp during freezing weather.

When the worms have processed a bunch of food waste and the bedding have now turned into castings (worm poop), these leftovers can be scooped out from the bottom of the bin, sifted, and used as fertilizer. The "worm juice" that comes out of the drain holes can be used as a liquid fertilizer to add even more nutrients to your garden.

Worm Juice/ Tea Liquid Fertilizer Ratio:

1 Part Worm Juice to 3 Parts Diluted Water

Use your worm fertilizer right away as it goes bad after 48 hours!



Compost Worms Food Facts

Here's some basic information for feeding your compost worms at home.

What is Vermicomposting Anyways?

Vermicomposting or worm composting is the act of utilizing earthworms to supply nutrients to soil by making compost. Red worms can be found around your home or in soil and can compost your food scraps for you! Composting worms eat their weight in food each day and they can eat both food scraps and paper waste and turn it into nutrient-rich plant compost.

Foods Worms Love

Worms love most foods. Foods like bananas, squash, peppers, carrots , strawberries, and watermelons are all popular worm foods that they love to eat. Many people are shocked to find out that worms love avocado!

Foods to Avoid

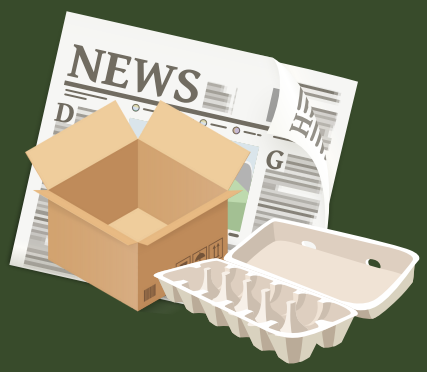
Avoid feeding your worms citrus, onion, garlic, tomato, and pineapple. These items can raise the pH in your indoor worm composting bin. Other food items to avoid include potatoes and cabbage peels because of their odor.

Chop Those Scraps!

Blend or chop up your food scraps into smaller pieces. Worms don't have teeth, and chopping up the scraps helps the worms eat the food items easier & faster.

Don't Forget the Bedding!

Add dry bedding such as newspaper, non-treated carboard, or color-free egg cartons every time you feed the worms to absorb the extra liquid. As food decomposes, it releases moisture. If left unchecked, the extra liquid could drown your worms!



Let's Create Our Own Vermicomposting Bins

Now that we've learned all about the benefits and purpose of vermicomposting, it's time to build our own worm bins!

Purpose:

Students create a worm bin which serve as a basis for investigations about ecosystems, life and nutrient cycles, and decomposition.

Estimated Time: 2 hours: (1 hour set-up & 1 hour observation

Materials Needed:

- Red wiggler worms (These worms have many different names but look for the scientific name Eisenia fetida. Readily available online)
- 2-Recycled Styrofoam coolers or large plastic tote like Rubbermaid bins if Styrofoam cooler is not available (Can be purchased at hardware store or received by donation from doctors or dentist's office since they utilize for medication deliveries)
- Drill with a large bit
- Shredded newspaper
- 2-3 pages non-treated or colored paper
- Spray bottle filled with water.
- Vegetable scraps
- Red wiggler worms

Let's Create Our Own Vermicomposting Bins

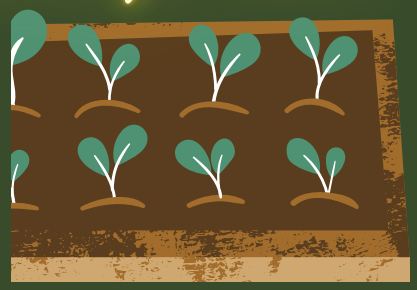
Did you know?

There are approximately 2,700 different kinds of earthworms.
The largest earthworm every found was in South Africa and measured 22 feet from its nose to the tip of its tail.
Charles Darwin spend 39 years studying earthworms more than 100 years ago.

Engage

1. Ask the students what the word recycling means. Make a list of items they have recycled before.
2. Ask the students if food can be recycled. Tell them to imagine they are in the cafeteria at their school. Have them try to think of ways they can use the leftover food being thrown away to make something else. (This question will probably bring interesting responses.)
3. Ask the students what happens to leaves in the forest during the winter. (They fall to the ground.) Ask them why the leaves that fall from the trees every year don't just pile up higher and higher. (They break down/decompose and become part of the soil.) Explain that food can be recycled in the same way plants are recycled in the environment. Tell them that they will recycle their leftovers into a special soil that will help give plants the nutrients they need. The secret is worms.
4. Tell the students that they are going to build a worm bin to serve as a home for worms that will be kept in the classroom to observe and study.
5. Show them the worms that will be added to the bin, and allow them to find a worm and look at it closely. Tell the group that these red wiggler worms are especially suited for composting food scraps inside an indoor bin.

Let's Create Our Own Vermicomposting Bins



Explore and Explain

Time to Set Up our Vermicomposting Bin

Prior to class, drill ventilation holes in the bottom of the Styrofoam cooler or Rubbermaid bin. Add the second bin to collect worm juice or tea to use as fertilizer for your garden. Have a vacuum cleaner handy—this can be messy!

- Ask the students what kind of environment they think worms need to be comfortable and healthy. (They will probably say worms need soil to live in.) Explain that the worms you have are a special kind that don't burrow deep into the soil. Red wiggler worms prefer to live near the surface of the soil where they have lots of organic matter to eat. They need protection from the sunlight but don't like to be deep in heavy soil. Explain to the students that they will be making them a home out of newspaper strips.

- Have the students rip newspaper into inch-wide strips to use as bedding for the worms.
- As the students are ripping the newspaper, discuss the importance of moisture, air, and temperature in the worm bin.

- Fill the cooler about half full with shredded paper. Wet the shredded paper until it is uniformly damp but not dripping. It should feel like a well wrung-out towel. Explain to the students that worms breathe through their moist skin. If they dry out, they can't breathe. However, if the bin gets too wet there may not be enough oxygen for the worms.
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- Mix the soil with the shredded paper. A couple of scoops with a trowel is plenty. The soil should be moist, but not muddy. Explain to the students that worms don't have teeth. The hard mineral particles in the soil will help break down food in the worm's gut. Soil also contains microorganisms that will help jump-start the composting process.

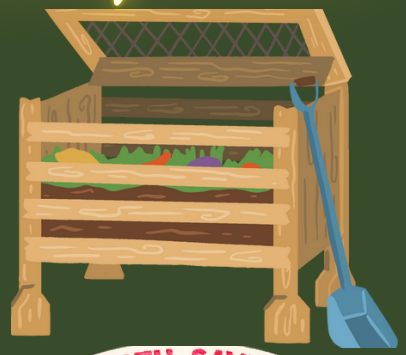
Let's Create Our Own Vermicomposting Bins

- Add the red wiggler worms on top, and watch as they burrow down to get away from the light.

- Add vegetable scraps as food for the worms. Begin with one cup or less. It will take the worms some time to acclimate to their new home and develop an appetite. Feed the worms as needed. Worms can survive on paper alone but will readily devour many other foods. Discuss with the students the kinds of foods that worms like to eat. They like newspaper, but the glossy pages aren't good for them. They like most food scraps, especially from fruits, vegetables, and grains. They also like coffee grounds and filters, tea bags, fallen leaves, eggshells, weeds, and lawn clippings. It is best not to feed them meat, dairy, or foods that contain a lot of fat. Avoid overfeeding to prevent odors. As the population begins to grow, the worms will eat more.

- Place full pages of paper on top of the soil and spritz with water until the paper is damp. Place the lid on top, and store the bin where it won't get too hot or too cold. Check the moisture level regularly. The top sheets of paper will help keep the bin contents moist; when they get dry, spritz the upper layer of the bin with water. The worms need moisture to live, but the bin may begin to stink if it gets too wet. If this happens, simply add shredded paper to absorb the excess moisture.

Let's Create Our Own Vermicomposting Bins



- Discuss the important things that worms do to keep the soil healthy:
  - Worms burrow in the soil. The burrows and trails that they leave help the soil absorb and hold water. This is important for plants that need water to grow. The burrows and trails also make it easy for plant roots to grow into the soil. When the soil is full of worm burrows and plant roots, it is less likely to wash away or erode when it rains.

  - Worms eat organic matter like dead leaves. The castings that come out the back end of a worm after it has digested its food are full of nutrients and microorganisms that are good for plants and for the soil. Worms eat dead plants and other waste and turn them into food for living plants. Worms act as nature's recyclers and make the soil fertile.

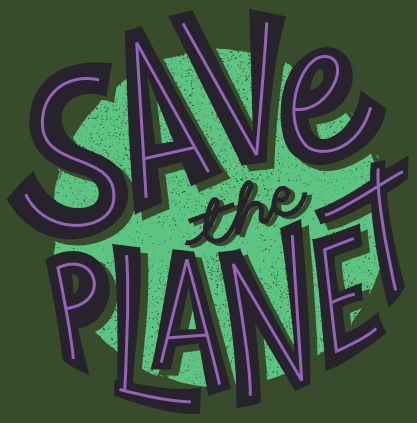
- Discuss the importance of soil as a natural resource that is necessary for the production of our food. Almost everything that we eat, much of what we wear, and many of the tools that we use originate from plants grown in soil on a farm.

Ending Questions:

Why do you think worm composting is important?

Do you think you could make your own worm bin at home?

What steps can you take to save the planet?



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