

COMPOSTING WITH WORMS!

With this lesson, children overcome their fear of these remarkable creatures and gain respect for the significant function they play in nature. You don't need a full composting system to try vermicomposting — just a few plastic bins and kitchen scraps!

LEARNING OBJECTIVES

Kids gain an understanding of growing food from the ground up through hands-on learning about the important role worms play in transforming our food scraps into healthy, rich soil. Kids foster a sense of responsibility caring for the worms.

RUNNING THE LESSON

Getting to know your worm (30 minutes)

1. To overcome possible fears, start of the activity by affirming that worms are harmless: they don't bite, they don't sting, and they don't move around quickly. Show the children they have nothing to be afraid of by holding a worm in your hand and letting it crawl around.
2. Spilt kids into groups of two or three at separate workstations. Demonstrate folding some paper towel until it forms a square that fits into the petri dish, then moisten it with the spray water bottle. Have one person from each group carefully select a worm, bring it back to their workstation, and place it onto the wet paper towel in the petri dish.
3. Advise the children to open up the petri dish every five minutes or so to give the worms air as so they don't suffocate. Emphasize the need to be gentle with worms: kids should be careful when closing the lid of the petri dish, so as to avoid worm injury. Ask the kids if it's true that cutting a worm in half will not kill it. Answer = not true! Contrary to common belief, cutting a worm in half will kill it and cause it pain.
4. Give the groups time to get to know their worm. Hand out the worksheets and have each group collaboratively draw their worm. Then use the questions provided on the worksheet to lead a discussion with the group.

AGE: 6 - 12, flexible

TIME: 60 minutes, divided into two parts

MATERIALS AND SETUP:

- Stations for children to work in pairs
- Each station is equipped with a petri dish, magnifying glass, ruler, pencil, pencil crayons, paper towel, and water spray bottle.
- One copy per child of the Composting with Worms! worksheet
- One copy per child of the Caring for Your Worms info sheet

Vermicomposter building materials:

- Drill
- Rubbermaid container, 50 L capacity
- Newspaper for shredding
- Kitchen scraps (be sure to only collect appropriate scraps — see Caring for Your Worms info sheet)
- A piece of corrugated cardboard, fitted to the bin
- Red wiggler worms (can be ordered online)
- Spray bottles

Stay in touch with your worms!

Each time the group meets, encourage children to check on the worm composter to make sure the worms still have food and that the composter isn't too wet or dry.

It's fun to monitor how long it takes for the worms to eat all the kitchen scraps. The smaller the pieces of food, the faster the worms can eat them.

While exploring with the worms, keep your eyes open for their eggs! Worm babies are really cute.

Making your vermicomposter (30 minutes)

1. Begin by discussing the benefits of composting with worms. For example, worms speed up decomposition and their compost puts more nutrients back into the soil. Composting also reduces food waste. Pass out the “Caring for Your Worms” worksheet and have the children read it in groups.

2. Have the children guess what different components you would need to make a successful vermicomposter.

Answers: Green matter (food scraps), brown matter/bedding (dry leaves, straw, or newspaper), moisture, oxygen, darkness

(Green matter infuses compost with nitrogen, the brown matter becomes carbon. We emphasize a ratio of three parts carbon to one part nitrogen as a healthy soil balance for vegetables and fruits.)

3. Break up the group into teams to tackle the tasks for creating a vermicomposter:

- Shredding paper into thin strips (as this is a bit time consuming you could have two teams working).
- Counting out the appropriate number of worms from your larger worm order. Start with around 50 worms.
- Chop and cut up kitchen scraps using either knives or scissors and cutting boards. Make sure to have an adult supervising this task. See the Caring for Your Worms info sheet for a list of what food scraps can and can't be used.
- Have an adult drill approx. 6 air holes into the bottom, sides, and lid of the Rubbermaid container.

4. When all the teams have completed their tasks, assemble the vermicomposter as follows:

- Bottom layer: food scraps, a bit of soil, leaves
- Middle layer/bedding: newspaper strips
- Top layer: a large piece of cardboard covering. Worms love cardboard — they hide in the ripples!

5. Once the vermicomposter is assembled, have a couple kids spray the newspaper bedding and cardboard with water until it is damp but not soaking wet.

6. Finally, add the worms gently to the bin. You can put them in the middle layer and they'll move around to find the most comfortable spot!

After two to four months, your compost will be ready for harvesting. A few days before you harvest it, put fresh food scraps and new bedding in one small corner of the bin and stop feeding the main area. Worms will migrate toward their new food source leaving rich brown compost for you to scoop out and use to power your garden! Then be sure to replenish the now-vacant side with new bedding and food scraps to restart the process.

TROUBLE?

Quick solutions to common composting issues

ISSUE:

- Worms are dying or trying to escape

CAUSE:

- Bin contents may be too dry or too wet, or the bedding is used up

SOLUTIONS:

- If too wet, add more newspaper bedding
- If too dry, moisten it
- If there's a buildup of bedding, harvest your bin and use the compost, replacing the amount harvested with fresh newspaper

ISSUE:

- Bin stinks!

CAUSE:

- Not enough air, too much food, or too wet

SOLUTIONS:

- Drill more ventilation holes
- Do not feed for 1–2 weeks
- Add more bedding

ISSUE:

Fruit Flies

CAUSE:

- Exposed food scraps

SOLUTIONS:

- Bury food deeper in the bedding

DISCUSSION QUESTIONS ANSWER KEY

1. What do they look like? (colour, shape, size, markings)

They're usually pinky brown with a pointy end and a round end. Their body has ridges (bristles) and sometimes there's a ring in the centre.

2. What is their skin like?

Their skin is slimy or damp, with ridges.

3. Is the pointy end of the worm the tail or the head?

The pointy end is the head.

4. Do you think they like to be wet or dry? Why?

Worms breathe through their skin. They prefer a damp environment. When their tunnels are too flooded, they come up to the surface for air and to move around more easily. They stay out in the sun until it gets too warm or until the soil starts to dry again, but worms prefer wet dirt over dry dirt, so that they can slither around easily.

5. How do they move?

Worms wriggle forward and back with their bristles, pulling themselves along.

6. Why do they like to hide in the dirt? How do you think they see?

They don't like the sunlight. Their skins are very sensitive and can burn with too much sun! Worms don't have eyes, they "see" by feeling vibrations — so they hide when they hear us coming.

7. How do you think they eat? Do they have teeth?

Worms don't have teeth, but eat with their gizzard (like birds). They eat tiny, tiny stones, bits of dirt, and rotting things like leaves, flowers, and dead insects. The stones and dirt help to grind everything up in the worm's stomach. Worms CANNOT chew bubble gum! They especially like eating at night when it's cool. They sometimes go above ground to find things to eat too, and then they pull their food back down as they wriggle into the earth again.

8. Can you tell if it's a male or female?

Worms have both female and male parts. They reproduce by rubbing up against one another. They form cocoons with eggs inside, just like ants or spiders. Two or three eggs hatch to form baby worms, which are small and white in colour.

9. If you were to cut your worm in half, do you think it would survive? Why or why not?

Some people think that if you cut a worm in half it will keep living and grow back. This is not true! A worm's tail can regrow if it's cut off, but cutting a worm in half will kill it.

10. Why do you think worms are important for nature?

Worms' poop is called a "casting," which is full of nutrients for the soil. When the worms move around, they spread their castings through the soil, so that nutrients are spread around the garden. Earthworm castings increase the amount of humus in the soil. The more humus, the healthier and more nutritious the soil is. Some people call worms "underground farmers."

Also, Worms dig holes in the soil to loosen the earth, allowing air and water to more easily reach the roots of plants and trees, so they can breathe and take up water. If the soil is loose, the roots of plants can stretch out under the soil too.

Worms are very helpful to us, our food system, and the environment!

CARING FOR YOUR WORMS

When should I feed the worms?

- Worms really do not like to be disturbed, so it is best to feed the worms once or twice per week – NOT every day!
- If a lot of food scraps are left over from a previous feeding, wait a day or two before adding additional food.

How do I feed the worms?

- Check out the table below for the kinds of foods you can feed the worms.
- Cut the food up into tiny pieces, so that the worms can eat it more quickly, and bury the food pieces a couple of inches down into the bedding of leaves, straw, or shredded paper.
- Bury the food in a different spot each time and be sure to cover the food with the bedding, because fruit flies are attracted to exposed food.
- Sprinkling a handful of crushed eggshells on top of the bedding once a week will help balance the acidity of the food scraps.
- Be sure not to overfeed the worms! Let the worms finish eating most of the food before adding more scraps.

What if the bin is wet or stinky?

- Maybe the newspaper is too wet. The newspaper in the bin should feel like a sponge that has just had all the water squeezed out of it.
- Worms produce heat and liquid. So if the bin gets too wet, add additional newspaper bedding.

DO feed the worms

- Fruit/vegetable peels
- Tea bags
- Cooked pasta & rice (no sauce)
- Crushed eggshells
- Coffee grounds/filters
- Egg cartons
- Sawdust (from untreated wood)
- Plant cuttings
- Brown paper towels
- Breads/cereals/grains
- Beans
- Leaf/grass clippings

Do NOT feed the worms

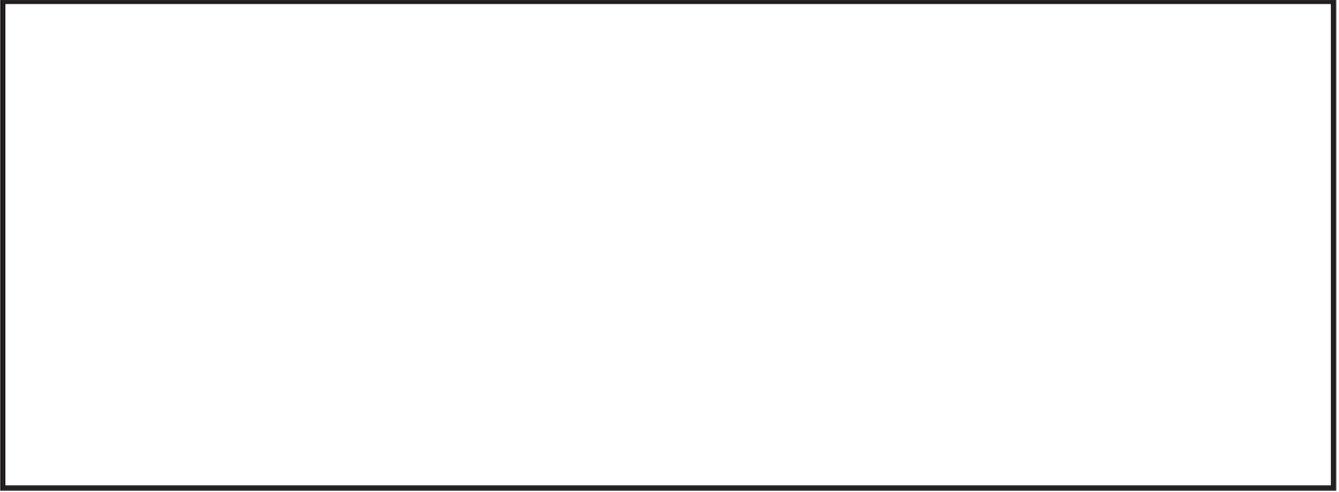
- Meat
- Dairy products like cheese or eggs
- Foods with oil like pasta sauce or salad with dressing
- Pet waste (poop)
- Citrus fruits, onions, and garlic (very small amounts are okay)
- Hot or heavily spiced foods
- Anything containing metal, foil, or plastic
- Chemicals, oils, solvents, insecticides, soaps, or paint

COMPOSTING WITH WORMS!

Names of people in your group: _____

1 Draw your worm

With your group, draw what your worm looks like and label its parts:



2 What do we know about worms?

1. What do they look like? (colour, shape, size, markings)
2. What is their skin like?
3. Is the pointy end of the worm the tail or the head?
4. Do you think they like to be wet or dry? Why?
5. How do they move? How do you think they breathe?
6. Why do they like to hide in the dirt? How do you think they see?
7. How do you think they eat? Do they have teeth?
8. Can you tell if it's a male or female?
9. If you were to cut your worm in half, do you think it would survive? Why or why not?
10. Why do you think worms are important for nature?