



HOW TO MAKE A WORM TOWER



CONNECTING JUNIOR GARDENERS PROGRAM

The Connecting Junior Gardeners Program is a four-part educational gardening resource developed by the Victorian Schools Garden Program (VSGP) for primary aged school children. The Program consists of a suite of videos, fact sheets and activities, developed to inspire and excite children to discover the joys and benefits of gardening together. As well as learning some of the foundations of gardening, children will be able to enjoy physical exercise, a connection with nature, being mindful and sharing the whole experience with their peers.

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Teacher Resource

INTRODUCTION

A worm tower acts like a high-rise hotel for worms, allowing them to enter, stay, eat and leave below ground - away from predators. It creates a suitable home for composting worms, who generally don't like to travel much, and who don't naturally thrive in your garden. Worm towers can be used instead of, or in conjunction with, worm farms and can be used around the garden to help build up worm populations and soil fertility. They are simple to implement and really easy to maintain.

Composting worms stay in and around worm towers, eating decaying kitchen scraps and distributing their castings (poo) in the soil as fertiliser for plants. As the scraps are eaten, the contents sink down and more scraps can be added. The holes in the buried half of the worm tower allow for enough air to percolate into the tower, so that a protective lid can be secured on top without causing problems. A lid prevents both moisture escaping and animals accessing the scraps. In dry seasons, a worm tower serves as a refuge for worms, though it is recommended that the surrounding area be kept moist.

Year 2 - Year 6 Activity

THERE ARE FIVE PARTS TO THIS ACTIVITY

1. Worm fact game: students will gain some background knowledge on worms.
2. How to make a worm tower: each student will get to make their own worm tower.
3. Decorating (*optional*): students can decorate towers as a part of art class.
4. Installation and set-up: students can either take towers home to set up, or use within the school garden.
5. Research: students are to research the composting worm.



WORM FACT GAME

HOW TO PLAY

All students are to start in the middle of the room. Read out each piece of information, one at a time. If students think it is *true*, they are to move to the right-hand side of the room; if they think it is *false*, they are to move to the left-hand side of the room. Encourage students to not be swayed by their friends and go with what they truly think!

1. There are around 1000 different types of earthworms around the world.

FALSE - there are over 6,000.

2. Earthworms are found on every continent. They even live in some oceans.

TRUE - they have been found on all except Antarctica.

3. Earthworms breathe through their nose.

FALSE - they actually breathe through their skin.

4. If an earthworm stays outside in the light for more than an hour, they will die.

TRUE - They may also be in danger if they are in soil that is too wet or too dry.

5. The reason that worms feel slimy is because they secrete a fluid that helps them to crawl and dig better through dirt, and also keeps their skin moist.

TRUE

6. The earthworms that you see after heavy storms are usually ones that have come from the clouds.

FALSE - They are a species commonly known as the rain worm.

7. Worms that typically come out at night are known as 'night crawlers'.

TRUE

8. Worms can be found digging down over 1km underneath the surface of the soil.

FALSE - they are typically only found in the top six feet (two metres) of soil.

9. Earthworms have a skeleton.

FALSE - they have no bones or skeletons.

10. Earthworms are usually boys.

FALSE - they are in fact both male and female at the same time, known as hermaphrodites.

All adult earthworms can lay cocoons, or eggs.



11. The largest earthworm ever found measured 2.3 metres long.

FALSE - the longest ever discovered was a whopping 6.7 metres long!

12. Most worms will live between 1-2 years. However, they can live as long as eight years.

TRUE

13. Earthworms love to eat both soil and fallen leaves. They eat their body weight in these materials each day.

TRUE

14. Pesticides kill common garden pests, but not worms.

FALSE - Pesticides negatively impact the worm population too.

15. Each small part of the body an the earthworm - called segments - are covered with hair-like bristles that are used by the worms for wriggling through dirt.

TRUE - their bristles also allows them to sense touch.

16. Earthworms help gardeners and plants by mixing air with the soil and loosening it around the roots of plants. Because of this, earthworms are very important to the ecosystem.

TRUE

17. Worm tunnels cause devastation when it rains, as it makes mud!

FALSE - worm tunnels actually help to hold soil in place and stop erosion through water, by allowing water to soak into the ground instead of wash soil away.

18. Earthworms have no ears or eyes, but they do have one end of their body that is more sensitive to light than the other.

TRUE

19. Worms can only crawl backwards.

FALSE - they can crawl both backwards and forwards in the soil.

20. The castings - or worm poo - produced by earthworms is actually a very beneficial natural fertiliser for plants.

TRUE - gardeners even purchase earthworm castings to mix with their soil.

21. Despite the fact that they may not seem like the smartest creatures, earthworms actually have the ability to remember some things. You can even teach them to avoid dangers.

TRUE

22. Earthworms are hatched from very tiny eggs that look a little like lemons. Baby earthworms look just like small adults after they hatch. It takes them between 10 and 55 weeks to become adults.

TRUE

23. Each adult earthworm can produce up to 20 eggs each year.

FALSE - they can actually produce up to 80 eggs a year.

24. In one year, the total number of earthworms in a given area can actually double.

FALSE - in just 90 days, the number of earthworms in a given area can actually double.

25. If you cut a worm in half, both pieces will survive, becoming two worms.

FALSE - Do not cut a worm in half! You will kill it, just like you would any other living creature.

26. Earthworms have blue blood.

FALSE - they have red blood, just like humans.

27. Most breeds of earthworms have up to five hearts.

TRUE

28. Over a million earthworms can be found in every single acre of land.

TRUE



HOW TO MAKE a WORM TOWER

BENEFITS

- Improves soil fertility
- Introduces and encourages worms to live in your garden
- Uses kitchen scraps and reduces waste to landfill
- Easy to make and maintain
- Can be used in small garden beds where regular composting may be impractical
- Can be made entirely from waste materials

MATERIALS

- PVC pipe (minimum 100mm diameter)*
- Sock/PVC lid
- Cardboard box/newspaper
- Drill and drill bit (minimum 8mm)
- Leaves/lawn clippings
- Food scraps
- Large handful of composting worms

**If PVC is not available, you can experiment with crates, tubs, boxes, pots, etc.*

PREPARATION & INSTALLATION (ADULT HELP REQUIRED)

- Cut a length of large PVC pipe about 50cm (500mm) long.
- Measure halfway down its length, then decide which half will be buried and which will stick up out of the ground. Draw a line around the pipe at this point.
- Drill lots of holes in the half that is to be buried (under the line).
- *Optional:* decorate the lid and above-ground half in art class.
- Dig a hole in your garden that is deep enough to fit your worm tower halfway, so that all the drill holes are below ground level.
- Place the worm tower into your hole and backfill the soil around it (but not inside), securing it in place. It should be an empty pipe all the way down.



HOW TO START YOUR WORM TOWER

Your worms will need bedding to retreat to, and to venture from to find food. Shredded newspaper and cardboard both make excellent worm bedding.

1. Shred a few handfuls of newspaper/cardboard into the bottom of the tower.
2. Pour in some water to dampen the paper.
3. Add composting worms, then a layer of kitchen scraps (a few handfuls) and a layer of grass clippings (also a few handfuls).
4. Put on the sock or lid and check back in a few days to see if the contents have reduced.
5. Continue to monitor and add a handful of finely chopped food when required. That's it!

WHAT CAN I FEED MY WRIGGLY GUESTS?

Anything you would feed into a worm farm, you can feed into a worm tower:

- Most fruit and veggie scraps - raw and finely chopped is ideal
- Egg shells (crushed)
- Shredded cardboard
- Shredded newspaper
- Grass clippings and leaves
- Coffee grinds and tea bags
- Hair and fingernail clippings

It's best to add a mix of things, and a little at a time, so that worms have a range of foods to choose from and can distribute a good range of minerals in their castings around your garden. Large amounts of any one material will likely cause problems. If you have excess scraps or other worm farm materials, consider composting them instead!

WHAT NOT TO FEED YOUR GUESTS

Some things your worms won't eat, while others can make them sick:

- Citrus (lemon, orange, mandarin, etc)
- Bread, rice, pasta
- Dog or cat poo
- Meat
- Onion and garlic



Handy Tips

FEEDING

- Worms wait until scraps are breaking down before they start eating them, so it may take a week or so for them to really get into it. Don't add any more scraps until you've seen the contents sinking, and add sparingly at first until they are happily eating everything you add.

LOCATION & MOVING

- Worm towers do really well in shaded places. Under trees is the natural environment for most composting worms, and they will migrate there. Worms don't do well in hot, dry spots. As your soil improves and worms are populating the area around your tower, you can carefully dig it up and move it to another bed. Bed by bed you can build up soil fertility in your garden and repeat again. Even better, you could add more towers!

DEPTH

- While composting worms prefer to stay close to the surface, different earthworms occupy different depths in the soil. If you install your worm tower about 50cm deep, your scraps will be catering to a wide range of worms, who in turn will fertilise your soil at different depths.

LIDS

- A perfectly fitting lid is not necessary for your tower; the lid is only there to stop moisture getting out and birds and flying insects getting in. An upside down empty plant pot does a great job as a lid. However, it may still let flies in, so consider fitting some old fly-screen over the outside, or packed in on the inside. A bowl for seed or water for birds can also be used as a lid - dual purpose! Just make sure it's easy to remove and replace.

CLEANING

- You don't need to clean your tower. Flushing will only wash nutrients out of the tower into the subsoil, where most plants can't access them. If you open your worm hotel and find it a bit dry, just add enough water (misting with a hose is enough) to moisten it. Worms will venture out of the tower and deposit their castings in the surrounding soil. If ever the conditions are imbalanced in your worm hotel, they will evacuate, returning when the problem resolves. If this happens, simply stop feeding and wait for the contents to sink again before re-feeding.

ADDING WORMS

- You won't need to keep adding worms to your tower after the first addition. Composting worms will adjust their population to suit the amount of food available. If you're consistent with your feeding, they will maintain a big enough population for your needs. However, if you are also worm farming in a worm farm, you can keep adding your surplus worms to your worm tower. Just make sure you feed your hotel adequately so there's enough for all to eat!

COMPOSTING WORM RESEARCH

Students are to research composting worms and their role in reducing organic waste going to landfill.

LEADING QUESTIONS

1. What are some common breeds of composting worms?
2. What are some interesting features of a composting worm - how many eyes, how long are they, how do they breathe, do they have hair, how many hearts, what coloured blood?
3. How much organic waste does the average household send to landfill?
4. How do they reproduce?
5. What's the longest worm ever discovered?
6. What do they eat?
7. What don't they like to eat?
8. How can worms reduce organic waste going to landfill?
9. Why is organic waste in landfill bad?
10. How much organic waste does the average Australian household send to landfill each week?
11. Why are worms called 'gardeners' best friends'?

