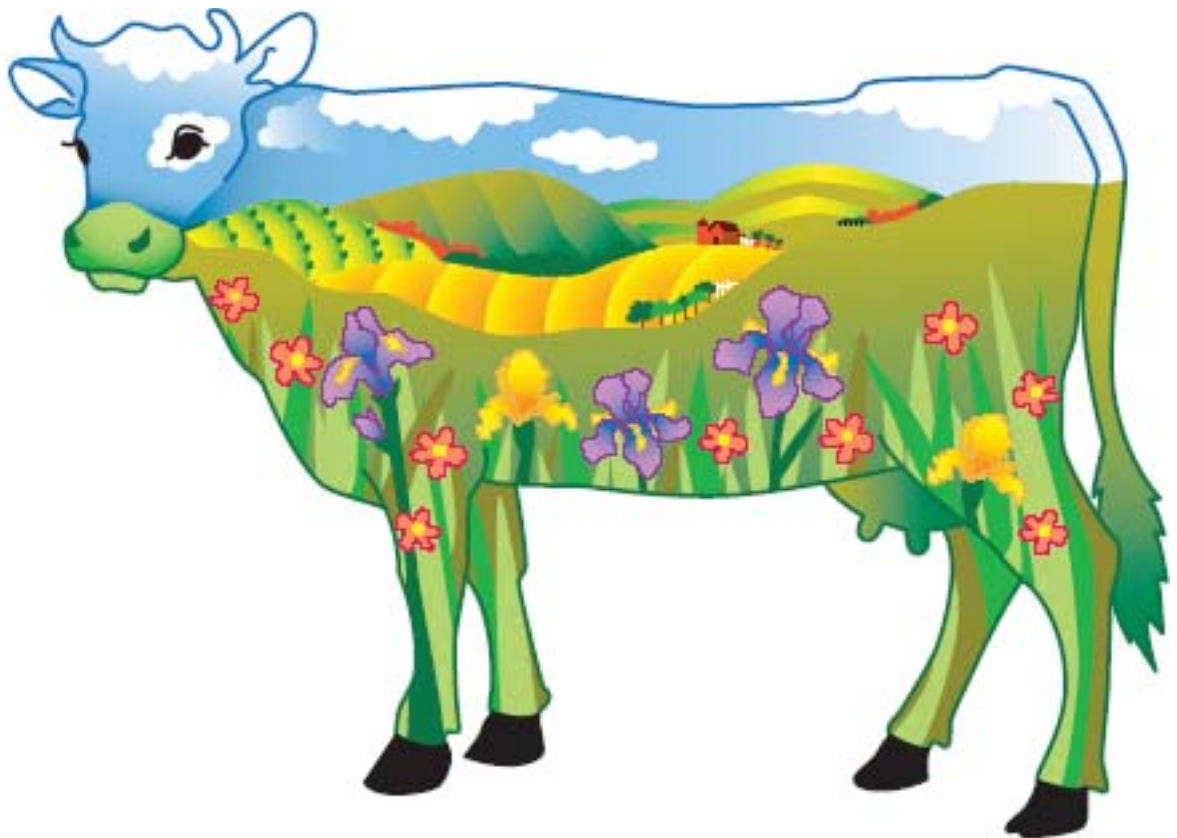


SOLE
Sciences of Life Explorations:
Through Agriculture
Intermediate Level



Teacher Guide
Unit: Vermiposting

UNIT PLAN

UNIT TITLE

Vermiposting - Indoor Composting

MONTH

February

GOAL

In this lesson, students will learn they can create a valuable product out of things they would normally throw in the trash. Students will learn about recycling and options for disposing of trash.

OBJECTIVES

Students will:

1. Perform basic mathematical functions by measuring the length of a worm. (NYS Learning Standard 3a: Universal Foundation Skills, Elementary 1 – Basic Skills)
2. Create a chart and record moisture, days passed, temperature, and smell. (NYS Learning Standard 3: Math, Elementary 5 – Measurement)
3. Calculate the number of worms needed for vermiposting a person's annual amount of compostable waste (NYS Learning Standard 3a: Universal Foundation Skills, Intermediate 1 – Basic Skills)
4. Compare and contrast the parts of earthworms and humans. (NYS Learning Standard 4: Science, Intermediate 1 – The Living Environment)
5. Explain how vermiposting reduces food waste at landfills. (NYS Learning Standard 4: Science, Commencement 7 – The Living Environment)
6. Construct a worm bin, modeling the vermiposting process in nature. (NYS Learning Standard 6: Interconnectiveness, Elementary 2 – Models)
7. Calculate the approximate number of worms in a given area. (NYS Learning Standard 3: Mathematics, Elementary 3 – Operations)

TERMS

Vocabulary words are highlighted in bold throughout the lesson pages.

Bedding - peat moss or shredded paper; provides housing and food for worms

Clitellum - the smooth, non-segmented band around an earthworm. A cocoon is formed on the clitellum when it is needed for reproduction.

Landfill - a place where trash from a large area is taken to be kept until it decomposes. A landfill can be very large and can grow in size as trash and soil are added. Some landfills become man-made mountains.

Moisture - the presence of water in something

Peat moss – any pale moss, either dried or alive, used for mulch or vermipost bedding

Recycle – change the original form of something for further use

Reduce – lessen; make smaller

Reuse – to use something again

Segment – the space between two parallel lines or rings on a worm's body

Setae – stiff, bristle-like hairs on a worm's body, that it uses for movement (pronounced SEE-tee)

Vermiposting- using worms in an indoor bin to break down scraps into compost

Integrated Pest Management is a specialized form of environmental management wherein scientific research and real world application work together to reduce pests such as insects, diseases or weeds.

- 1. Proper identification of pests*
- 2. Learn the pest/ host biology*
- 3. Sample the environment for pests*
- 4. Determine an action threshold*
- 5. Choose the best tactic*
- 6. Evaluate results*

SAFETY

Students should wash hands after handling worms, and follow general safety practices

Standards Matrix for this Lesson:

Standards:

Month	Unit	Math/Science/and Technology	English Language Arts	Social Studies	HEALTH	ARTS	Food & Fiber Literacy	CDOS	Other Languages	Interconnectedness
2	Vermiposting	3:9: e5						3a:2:e1		6:12: e2
		4:10: i1						3a:2:i1		
		4:10: c7								
		3:9: e3								

Standards Matrix Key:

NYS Learning Standards arranged by Standard: Category, Level

e = elementary; i = intermediate

Categories:

- | | |
|---|--------------------------------------|
| 1 Career Development | 11 Technology |
| 2 Universal Foundation Skills | 12 Interconnectedness: Common Themes |
| 3 Language for Information and Understanding | 13 Interdisciplinary Problem Solving |
| 4 Language for Literary Response and Expression | 14 History of the U.S. and New York |
| 5 Language for Social Interaction | 15 World History |
| 6 Communication Skills | 16 Geography |
| 7 Analysis, Inquiry, and Design | 17 Economics |
| 8 Information Systems | |
| 9 Mathematics | |

ADDITIONAL RESOURCES

Worms Eat My Garbage by Mary Appelhof ISBN# 0-942256-10-7

Compost Guide - <http://compost/css.cornell.edu/worms/wormhome.html>

Resources for Live Worms (classroom vermiposting kit available for purchase) - <https://www2.carolina.com/>

<http://www.urbanext.uiuc.edu/worms/anatomy/index.html>

www.wormdigest.org

<http://42explore.com/worms.html>

<http://yucky.discovery.com/flash/worm/pg000216.html>

www.wormwoman.com

SUPPLIES AND EQUIPMENT

Magnifying glasses

Yarn

Scissors

Rulers

Scale

Thermometer

For optional vermiposting bin:

Plastic bin

Bedding (peat moss or shredded paper)

Water

Worms (Red Wiggler)

(Complete classroom vermiposting kits are available commercially, with all supplies included)

BACKGROUND FOR TEACHERS

Introduction to Vermiposting

Vermiposting is easy and a good way to teach students about recycling. Students will learn about landfills, and how a lot of things that go to landfills can be recycled including some of their very own food scraps. Vermiposting allows people to get rid of their food-scrap in a safe and environmentally-friendly way. In the unit "Earthworms on the Job," we learned that earthworms are farmers themselves, and do a great job of plowing soil. This unit will build on that concept.

Red Wigglers

Red Wigglers are a type of worm that can recycle food scraps and thrive in a properly maintained worm bin. They are found naturally in manure and organic piles. They have 5 pairs of hearts, no bones, eyes, lungs, or teeth. The worms are actually both male and female (hermaphrodites), but they cannot impregnate themselves. They are quite prolific, so you will never have to worry about a dwindling worm supply if provided with the proper environment. Neither would you worry about growing too many because they are self-limiting, and will only reproduce as food and space allows. Red wigglers can be added to outdoor compost piles for the summer months if you will not be able to manage the bin at that time. There are many sources for red wiggler worms, and a quick search online can easily find suppliers. They are typically purchased by the pound.

Worm Anatomy

Worms have a head and a tail. The head of the worm is the 'anterior' and the tail end is the 'posterior.' Their body is segmented and compartmentalized, and they range in length from a few inches up to a few feet depending on the species. They do not have eyes, ears, or lungs, and can only breathe when there is air present between soil particles.

When soil becomes flooded from rain, you will notice that worms can be found on the top soil. This is because they are looking for air.

Worms move by using longitudinal muscles that extend the front of its body pushing into the soil ahead of it, then pulling the back part up behind it. The worm has tiny hairs on the outside of its body, these are called 'setae,' pronounced 'see-tee.' The setae stick into the surrounding soil to keep the worm from slipping. Worms have segments, which look like rings around its body. Each segment has four pairs of setae. The first segment is its mouth, and the last is its anus.

For more information on worms and their anatomy, refer back to "Earthworms on the Job."

Requirements

The worm bin must meet the housing requirements of the red wigglers. Your input of food, moisture and organic bedding will control the success and population of your worm bin. The worms are sensitive to vibrations and light, so the worm bin should be kept still and dark. They do not have lungs but they do require oxygen. Oxygen is absorbed through their skin, so the bin cannot be too wet or they will drown. The bin cannot be too dry either, or they will die. The worms prefer room temperatures (ideally 65 to 75 degrees Fahrenheit), so do not set the bin in the sun or let it get too cold.

Worm Bins

A bin measuring 18 inches by 24 inches by 12 inches high works well for one pound of worms. The bin must have enough surface area for the worms to inhabit, so it should be longer and wider than tall. Any plastic bin will do, though you can purchase one from a supplier. Holes should be punched in the top lid, but it is not generally recommended to punch holes in the bottom unless you can put a tray beneath. Holes in the bottom would allow you to avoid overly wet bins.

Hearty Appetites

Red wigglers can eat up to half of their body weight every day. Generally two pounds of red wiggler worms will easily be able to handle one pound of food scraps per day. They do not have to be fed scraps every day, and can live for several weeks as long as there is adequate bedding. If you have access to a food scale, this is an excellent time to introduce it to your students. They can track the amount of food scraps added by the week until they get an idea of how much is enough or too much to add. A good supply of food encourages them to reproduce. When food supplies dwindle, reproduction slows and some worms will die. Rotate the location of where food scraps are added. Keep food scraps in a container to accumulate until they are added to the bin.

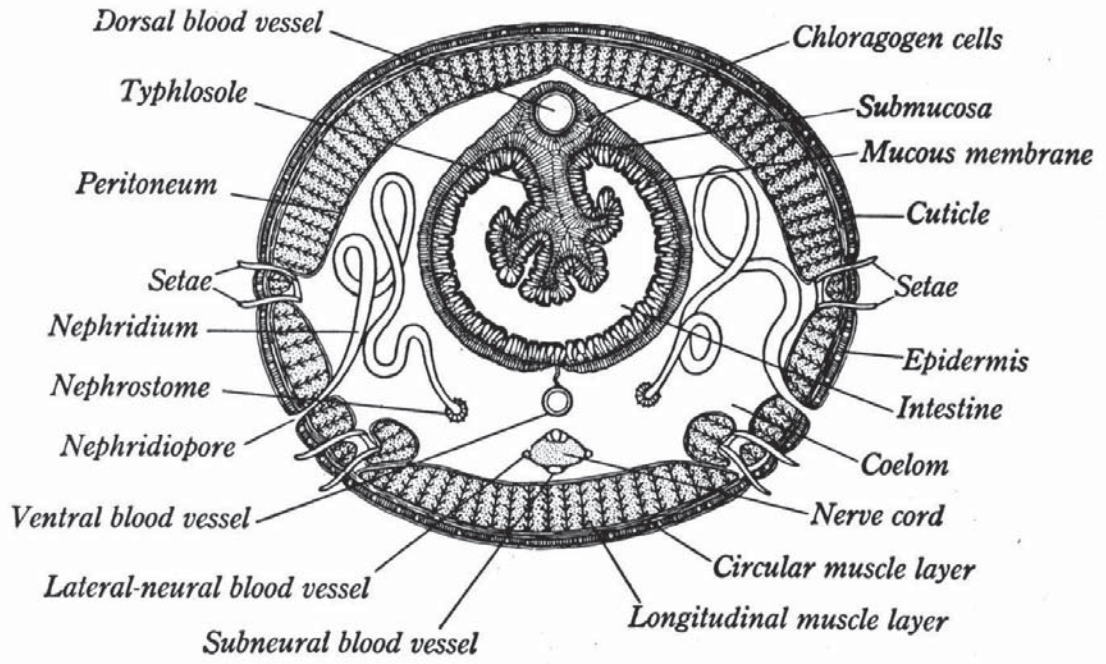
No Worries; No Smells!

You and your students will be surprised that a worm bin rarely has an odor. If there is an odor, it may be because the bin is too moist, or not getting enough air. Also, it is not recommended to add onions, broccoli, meat, bones, dairy, and oily foods because they may smell when decomposing. Some foods, such as orange peels, rapidly become moldy. Therefore, students who are sensitive to molds should not be expected to be care takers. Another concern can be fruit flies, however they are easily prevented by keeping a layer of shredded paper on top of the bedding.

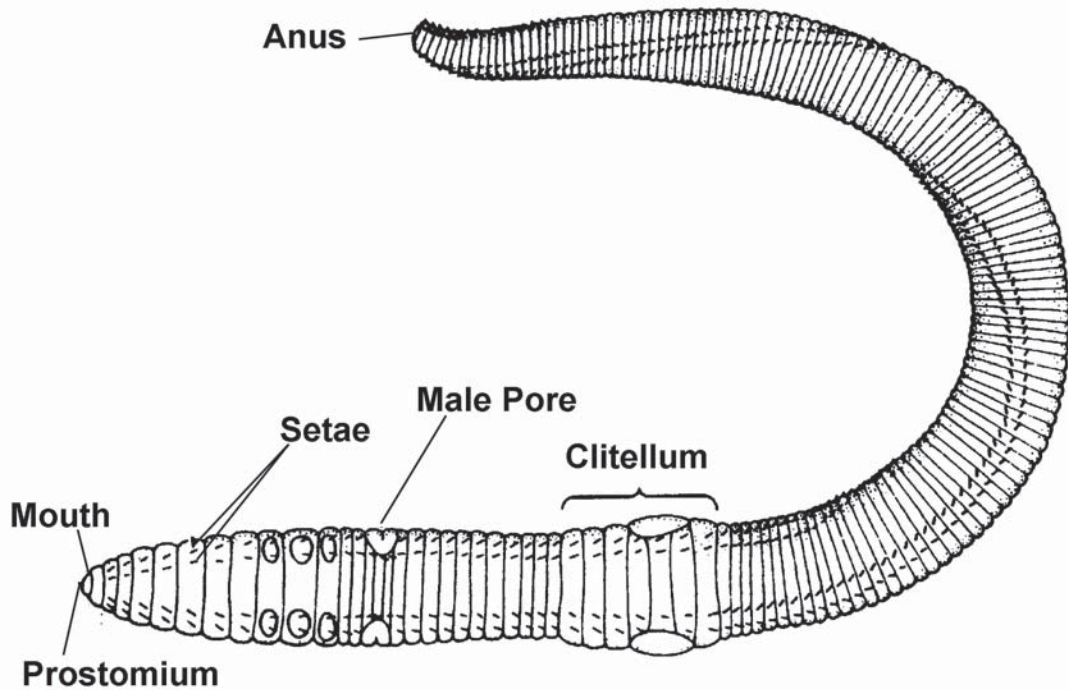
Using the Compost From Your Bin

During the school year, you will be able to harvest compost from your worm bin. After about 3 months, your worms will have recycled all their original bedding and food into compost. For their health, you should remove the compost and add new bedding. Instructions on how to harvest compost are found later in this workbook.

Worm Anatomy Diagrams



Cross Section of Earthworm



QUESTIONS FOR STUDENTS

What is vermiposting?

What do you know about worms?

How much do worms eat? What do they eat?

How do I make a worm bin?

Is the worm bin going to smell?

INTEREST APPROACH ACTIVITIES

The Body Parts of the Worm

Teacher Information:

Worm anatomy is interesting and fun because worms are so unique! The teacher may want to have students access the following website online prior or in conjunction to this interest approach. The site is an interactive way to learn the parts of the worm by learning from Herman the Worm. <http://www.urbanext.uiuc.edu/worms/anatomy/index.html>. This lesson intends to let students look at the parts of the worm through hands-on examination.

Materials (Per student or pair of students):

Magnifying Glass Worm Observation handout

Ruler Paper towel

Worm*

Procedure:

1. Pass out supplies
2. Place worm on paper towel
3. Ask the students to gently examine the worm
4. Students should use the observation handout as a guide to this activity.
 - A. SEE
 - i. Students observe the worm with the naked eye.
 - ii. What does the worm look like?
 - a. Students should write 5 descriptive words on the handout
 - b. Examples: long, squishy, brown
 - iii. Students use the ruler to measure the worm in centimeters and inches
 - iv. Students use the magnifying glass to look at the worm
 - v. Label body parts as directed on the handout.
 - A. FEEL
 - i. Students pick the worm up in their hands
 - ii. Worms feel soft and slimy.
 - a. Their skin must be kept moist for them to survive
 - A. SMELL
 - i. Students smell the worm
 - ii. There shouldn't be much of a smell
 - iii. Some students might say it smells like soil or dirt
5. Once students have completed the handout, ask them to bring their worms to you.
6. You can put the worms in your worm bin.
7. Throw away the paper towels
8. Students should wash their hands

*If the class is making a worm composting bin, Red Wiggler worms should be used for this activity.

You have been given a worm to observe. Worms are a lot of fun to play with, but remember to be gentle! Use three of your five senses to observe your worm and answer the following questions.

1. What are your five senses?

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____

2. Which senses would you NOT use to observe your worm?

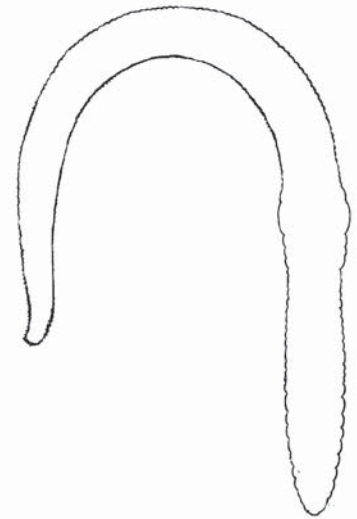
- A. _____
- B. _____

3. Write five words that describe your worm:

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____

4. Measure how long your worm is with the ruler. Measure in both inches and centimeters.

- A. _____ inches
- B. _____ centimeters



Now use the magnifying glass to look at your worm. Notice that there are rings around the worm's body. These are called segments. Adult worms have 120 to 150 segments.

Can you see little hairs coming from each segment on the worm? These are called setae. Setae allow the worm to have better grip while moving in the soil. Each segment has four setae coming from it.

Worms have a clitellum, a special body part that allows the worm to reproduce. It looks like a lighter colored band, and is larger than the segments. The clitellum is located near the head. This is how you know which end is which!

5. Draw a clitellum and some segments and setae on the blank worm above.

6. Look at the worm's head with the magnifying glass to see if it has eyes. Does it?

- Yes _____
- No _____

7. Pick your worm up gently. It might wiggle around to try to get loose, but don't grab it tightly. Worms are really flexible because they don't have a backbone like people do! What does your worm feel like – moist or dry?

- Moist _____
- Dry _____

A worm's skin needs to be kept moist. If the worm gets dried out, it will die!

Worms and You: Similarities and Differences

Background:

Worms and humans have some similarities and differences. If you do not have access to worms in order to do the first interest approach activity, this activity is a great alternative.

Worms Have:	Worms Do Not Have
Five Hearts	Eyes
Gizzard	Lungs
Clitellum	Arms
Segments	Backbone
Setae	Bones
Mouth	Teeth

Humans Have:	Humans Do Not Have
One Heart	Gizzard
One Pair of Lungs	Clitellum
Mouth	Setae
Teeth	Segments
Bones	Five Hearts
Arms	

Robin Redbreast's Appetite

adapted from <http://www.wormdigest.org/content/view/343/2/>

A young robin can eat as many as 14 feet of earthworms a day!

Materials:

Yarn
Scissors
Rulers

Procedure

1. To help students visualize how much a young robin actually eats, have students measure and cut 14 feet of yarn.
2. Have students line up, each holding on to the yarn.
3. How many students does it take to hold the length of yarn?
4. That's a lot of worms for one small bird who doesn't weigh more than three ounces!



Worm Snacks

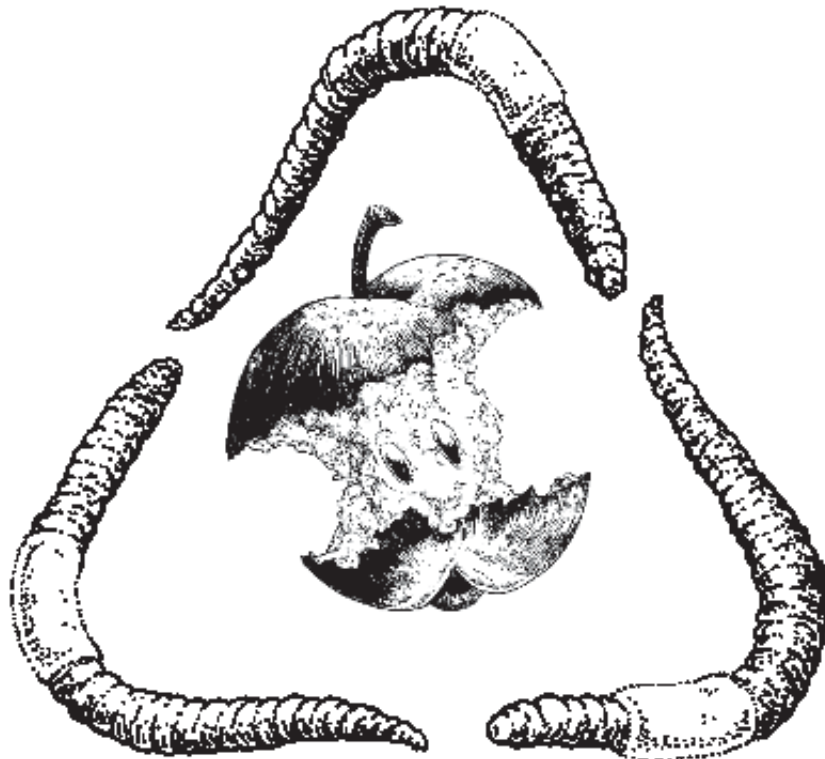
Materials:

Food scale

Various food items

Thermometer

1. Once a week, have students bring in at least one item for a snack that can be shared with the worms in the vermiposting bin.
 - A. As a class, generate a list of ideas for such items.
2. Using the food scale and the information students will have learned in the lesson, calculate the appropriate amount of snack food to contribute to your vermiposting system.
3. Make sure the bin is moist, but not wet.
4. Have students check and log information:
 - A. Temperature
 - B. Smell – does it smell different, unlike dirt?
 - C. Number of days it takes for each food wastes to be broken down
5. Experiment:
 - A. Feed the worms only cardboard and paper for a week
 - B. Recording the time it takes to break the waste down
 - C. Compare with the time it took for the food items



SUMMARY OF CONTENT

- I. Introduction
 - A. Defines vermiposting.
 - B. Questions may be used to stimulate discussion.
- II. Worm Diet
 - A. Discusses what, and how much, worms eat.
 - B. The terms bedding and moisture are introduced and defined.
- III. What Happens to my Garbage?
 - A. Discusses recycling, and gives facts about how students can recycle.
 - A. Vermiposting reduces food waste
- IV. How do I Make a Worm Bin?
 - A. The steps of creating a worm bin are listed and explained.
- V. Is it Going to Smell?
 - A. Vermiposting rarely results in odors.
 - B. Starting a worm care journal.
- VI. Vocabulary
 - A. Provided for reference
- VII. Review
 - A. Questions to test comprehension
- VIII. Lesson Supplement

TEACHING-LEARNING ACTIVITIES

- I. Introduction
 - A. This page may be read individually or aloud with group discussion.
- II. Worm Diet
 - A. Students may read this page individually or it may be read aloud and discussed as a class.
- III. What Happens to my Garbage?
 - A. This reading may be done individually or used to stimulate discussion that includes the questions.
- IV. How do I Make a Worm Bin?
 - A. Have students read this page individually or as a group.
- V. Is it Going to Smell?
 - A. These pages may be read individually or aloud with group discussion.
- VI. Vocabulary
 - A. Provided for reference
- VII. Review
 - A. Should be completed individually.
 - B. May count as a quiz
- VIII. Lesson Supplement

Student Lesson: Vermiposting What is Vermiposting?

What is vermiposting?

What do you know about worms?

What do worms eat?

How much do they eat?

How do you make a worm composting bin?

Is it going to smell?

Would you like some worms in your classroom?

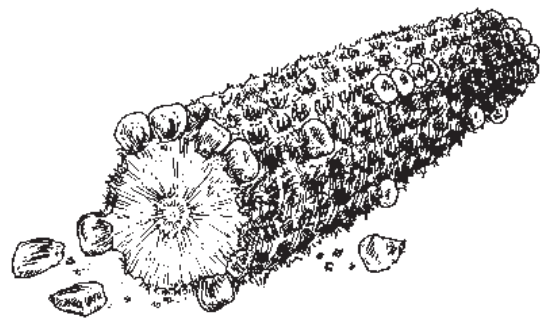
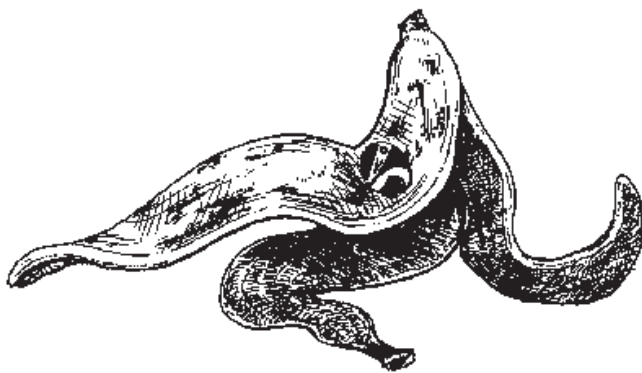
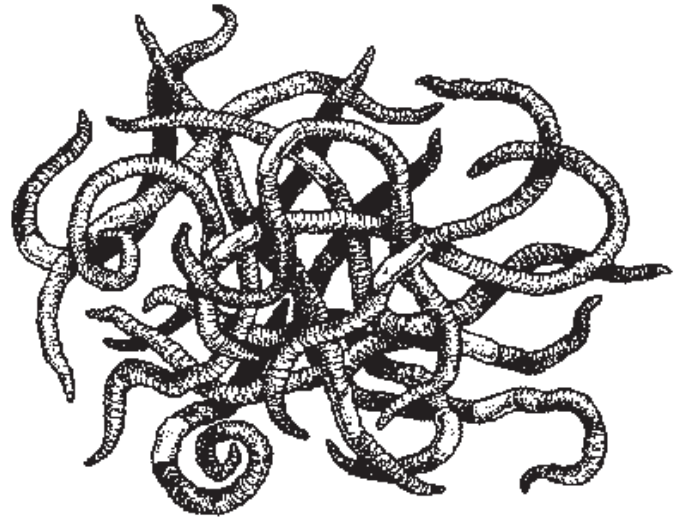
How about at home in your kitchen?

Why or why not?

Why should we reduce waste?

Just like composting outdoors is a good way to reduce trash going to the landfill, using an indoor composting system reduces waste and provides a great product in return. In other lessons, you may have learned about how worms eat soil and organic material like leaves and plants, and turn it into a great fertilizer called castings.

Composting with worms is called vermiposting. A certain kind of earthworm called the Red Wiggler makes an excellent indoor composter. They love to eat your fruit and vegetable leftovers and turn them into a great compost to add to your house plants or garden! They are not as big as the earthworms we see outside. As their name implies, they are more red than brown.



Student Lesson: Vermiposting Worm Diet

You may already know something about composting and earthworms. Now we can put that knowledge together and learn about vermiposting.

How much do worms eat?

Worms can eat as much as their body weight in food each day! It's best to give them about half of that. So, two pounds of Red Wigglers can handle a pound of food a day.

Six pound of worms will eat _____ pounds of food!

What do worms eat?

You've learned that outdoor compost piles do best with a mix of "greens" and "browns." In your worm bin, bedding materials like peat moss and shredded paper are the "browns." Fruit and vegetable scraps are the "greens." Just like outdoor compost piles, do not add meat, dairy, fats, or oils.

Remember, worms need moisture! Keep the bedding moist, but not too wet.

Most of the time, food scraps from your lunch or snacks go into the trash can at school or at home. List five things from you breakfast or lunch you could put in the worm bin instead of throwing them out.

1. _____
2. _____
3. _____
4. _____
5. _____



Student Lesson: Vermiposting What Happens to My Garbage?

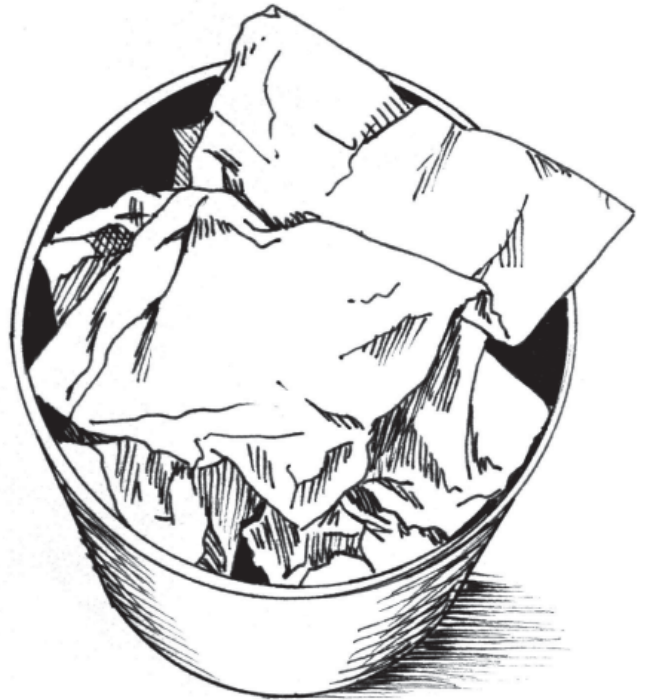
Do you ever think about where your garbage goes after you drop it in the wastebasket? It goes to the landfill. If you've ever seen a landfill, you know just how full they are! Do you think it's a good idea to keep filling them up quickly, or to try to reduce the amount of trash we send there?

Aluminum cans, and most paper, plastic, and glass should not be thrown away with the garbage.

It can be recycled. It takes effort to recycle. Is it worth the extra work?

Each year the average American throws out 1200 pounds of organic garbage that could be composted instead!

How many pounds of Red Wigglers would you need in order to vermipost all that food in six days?

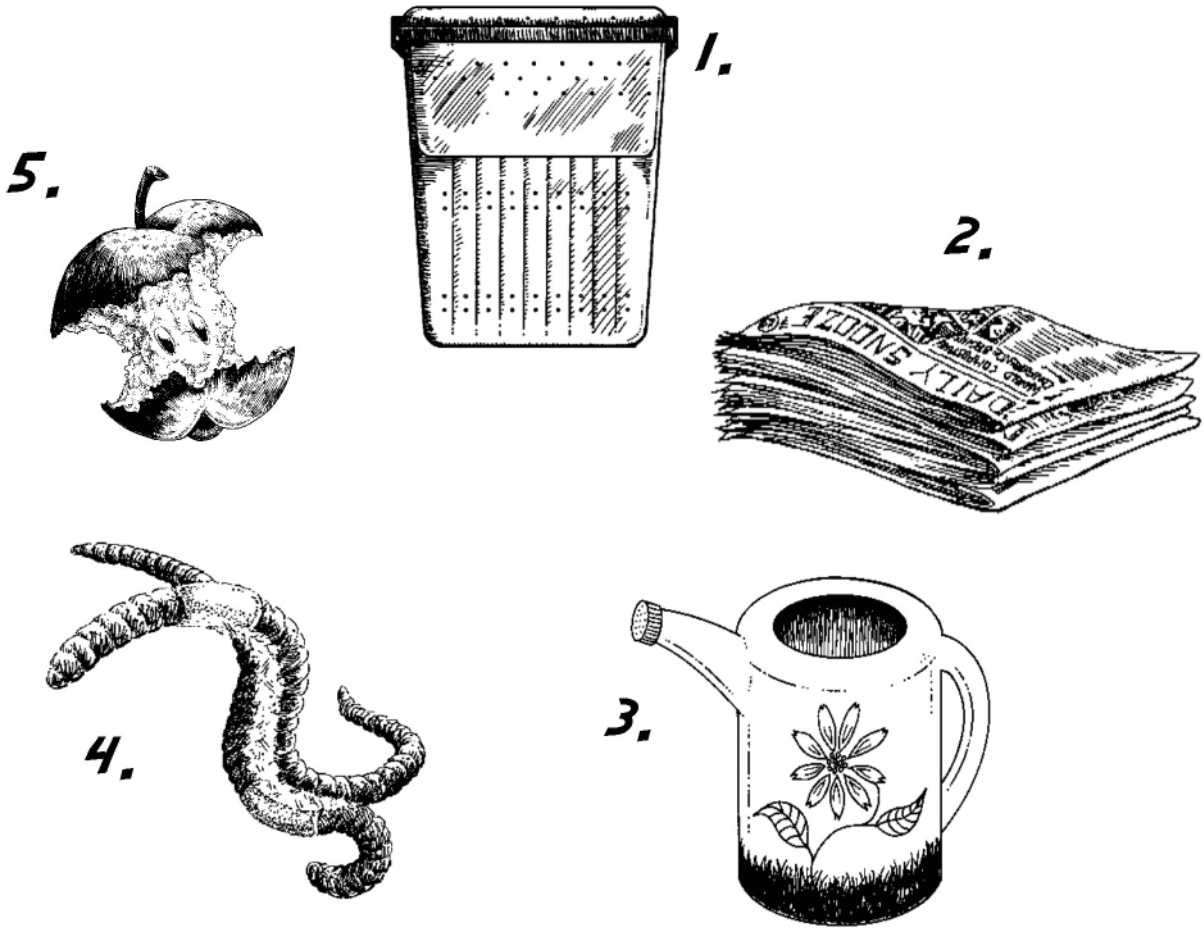


When you recycle or compost, the amount you actually throw away is reduced. If you are interested in facts about reducing the amount of waste going to landfills, ask your teacher.



Student Lesson: Vermiposting How Do I Make a Worm Bin?

1. Start with a bin. It needs to be at least 12" deep. You can purchase one ready-made, or set up your own!
2. Fill about halfway with bedding. This can be shredded paper, peat moss, or a combination of both.
3. Carefully add water. It needs to be damp like a sponge - not too wet or too dry!
4. The next day, if the bedding is ready, add your worms. The best worms for vermiposting are Red Wigglers (scientific name: *Eisenia fetida*).
5. Now, they're ready to eat your scraps!



Student Lesson: Vermiposting Is It Going to Smell?

Keeping food garbage in your house or classroom may not seem like a great idea at first, but many people do it with little or no trouble. There is rarely an unpleasant smell. Scraps may start to get moldy before you put them in the bin, and it may have an earthy smell, like soil in springtime. You may be very surprised at how little odor a worm bin has!

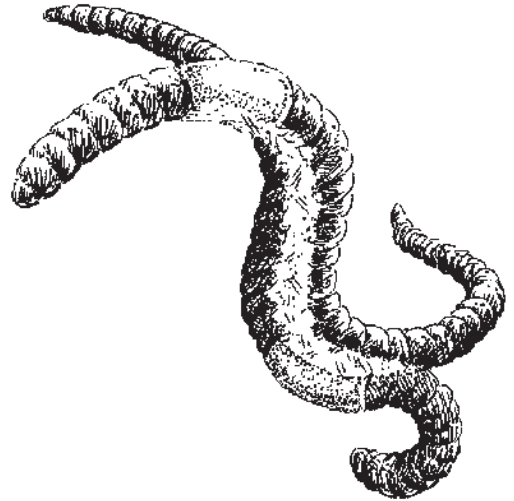
Like any other living creatures, worms do have some needs and are not completely care-free. You will have to make sure the bin is not too hot or too cold, that it doesn't dry out, and that food is being supplied on a regular basis.

Here are some suggestions:

It is generally more convenient to only add scraps to the worm bin once or twice a week.

Collect your scraps in a container throughout the week until they're ready to add. This can be a closed or open container that you can keep on the counter.

Start a worm care journal to keep track of when food is added.



Vermiposting Record

Date	Name	What Added
Feb. 7	Jewiter	Lunch scraps
Feb. 4	Taylor	Water
Feb. 11	Carlos	Apple cores and water
Feb. 18	Raymond	Water
Feb. 25	Sasha	Lunch scraps

To add food:

Use a small spade or garden tool, and move the worm bedding enough to create a hole or trench. Add the food and cover it with bedding.

The next time food is added, place it in a different area of the bin.

Cover the scraps with bedding or shredded cardboard, newspaper, or other paper, to keep fruit flies from appearing.

Every 3-5 months, you will need to remove the compost and add more bedding. Your teacher will have special directions for this. The compost can be added to houseplants or to outdoor containers or gardens.

Student Lesson: Vermiposting Vocabulary

Bedding - peat moss or shredded paper; provides housing and food for worms

Clitellum - the smooth, non-segmented band around an earthworm. A cocoon is formed on the clitellum when it is needed for reproduction.

Landfill - a place where trash from a large area is taken to be kept until it decomposes. A landfill can be very large and can grow in size as trash and soil are added. Some landfills become man-made mountains.

Moisture - the presence of water in something

Peat moss – any pale moss, either dried or alive, used for mulch or vermipost bedding

Recycle – change the original form of something for further use

Reduce – lessen; make smaller

Reuse – to use something again

Segment – the space between two parallel lines or rings on a worm's body

Setae – stiff, bristle-like hairs on a worm's body, that it uses for movement (pronounced SEE-tee)

Vermiposting- using worms in an indoor bin to break down scraps into compost



Integrated Pest Management is a specialized form of environmental management wherein scientific research and real world application work together to reduce pests such as insects, diseases or weeds.

- 1. Proper identification of pests*
- 2. Learn the pest/ host biology*
- 3. Sample the environment for pests*
- 4. Determine an action threshold*
- 5. Choose the best tactic*
- 6. Evaluate results*

Student Lesson: Vermiposting Review

Review Questions

1. Can the same kinds of food scraps be added to outdoor compost bins and indoor compost bins?

_____ Yes

_____ No

2. Can you reduce the amount of trash going to landfills?

_____ Yes

_____ No

3. If yes, explain one way you can do this every day:

4. The best kind of worms to use for vermiposting are:

A. Nightcrawlers

B. Red Wigglers

C. All worms are the same

Teacher Information for Student Worksheets

Worm Observatiobn Handout

Answers:

1. See, hear, touch, taste, smell
2. Taste and smell
3. Answers will vary
4. Answers will vary
5. Answers will vary
6. No
7. Moist

Student Worksheet 1

What is vermiposting?

Order your worm bin as a complete kit or purchase the items separately. A bin must have some sort of air circulation, so you may have to drill tiny holes in the lid of a standard bin. Peat moss or worm bedding is available at landscape nurseries or fishing supply stores. Worms can be purchased online through many suppliers, or at bait shops. Many cities encourage their residents to start worm bins and reduce trash at the curbside. Red wigglers are sometimes called “compost worms” or “trout worms.” Remember, the common outdoor earthworm is not the best worm for vermiposting.

Student Worksheet 2

What do worms eat? How much do they eat?

Answers:

Sixpounds of Red Wigglers will eat three pounds of food,

What will you feed them? Apples, apple peels, banana peels, cabbage, celery, coffee grounds, cucumber, egg shells, grapefruit peels, grapes, lettuce, onion, pears, pineapple, tea bags, tomatoes, bread crusts, pizza crusts, and cooked pasta are all good. Always avoid meats, cheese, and other animal products; and fats or oils.

Student Worksheet 3

What happens to my garbage?

Students and teachers are often surprised when they learn about the amount of trash that goes to landfills each day in our country. The good news is that something can be done about it. Recycling can become a good habit. When students understand that vermiposting is a good way to recycle and reduce trach, they may be more be interested in it.

Answer:

$1200 \text{ pounds} \div 6 \text{ days} = 200 \text{ pounds/day}$. It would take 400 worms to process 200 pounds.

Student Worksheet 4

How do I make a worm bin?

Starting a worm bin is easy! While not cuddly, worms make good classroom companions because they quietly work for their keep, producing a useful product and helping the environment. It may take a few weeks to get the right balance of food and worms in your bin. Closely monitor the moisture and density of the bedding. Add shredded paper often, and keep it as a blanket on top of the bedding/food mixture to discourage fruit flies and odors.

Keep the bin out of sunlight, cold, and heat. Because it is an enclosed system, do not over-water. Bedding must be moist, but there should not be standing water in the bottom.

Student Worksheet 5

Is it going to smell?

Worm bins rarely have an odor, other than that of soil. If your bin does have a strong sour or rotting odor, it is not working properly. The most common source of odor is food waiting to go into the bin. You can decide how often to add food scraps. We recommend using a tightly closed container and emptying it once a week into the worm bin.

You may want to exclude orange peels from your vermiposting bin. It is not uncommon for them to become moldy before they decompose, and some students can be sensitive to odors or molds.

Despite these small challenges, we certainly would encourage you to try vermiposting. After a couple weeks, you will be able to see what is going to work best in your classroom. Whether your class starts a vermiposting bin or not, your students can learn the benefits of vermiposting as a way to reduce trash going to the landfills. This lesson will also reinforce previous lessons about earthworms, soils and composting.

Student Worksheet 6

Vocabulary

Provided for student reference

Student Worksheet 6

Review

Answers:

1. Yes
2. Yes

Explanation may include:

Recycle paper and plastic, use a compost bin, use washable containers for lunch rather than disposable bags, return plastic shopping bags to the store to be recycled, reuse gift bags rather than throwing away wrapping paper, recycle aluminum cans and glass, refill a water bottle instead of getting a new one every time, repair clothes instead of throwing them out, etc.:

3. B: Red Wigglers

Lesson Supplement:

The Worms beneath Your Feet

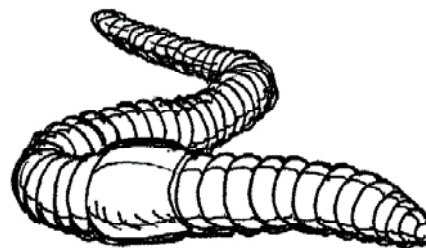
Did you know that one acre of land (43,560 square feet) can have as many as 1 million worms!!
So every square foot could have as many as 23 worms!

Do you know what a square foot is?

How big is your classroom or school garden? How would you calculate the area in square feet?
Once you know the square footage of your classroom or garden, how many worms could be underneath your feet?

My classroom or garden is:

_____ feet long and _____ feet wide



Then the area is _____ X _____ = _____ sq.

If my area A is _____ sq. ft. and there are _____ worms in a square foot, then
how many worms are in the soil under my classroom/garden?

_____ X _____ = _____ worms!

Now every time you take a step just think about all the worms
beneath your feet!!

Lesson Supplement:

Example Problem

My classroom or garden is:

20 feet long and 20 feet wide

Then the AREA is 20 X 20 = 400 sq. ft.

If my AREA is 400 sq. ft. and there are approximately 23 worms in a square foot, then about how many worms are in the soil under my classroom/garden?

400 X 23 = 9200 worms!