



Waste Management and the Compost Cycle

4th-7th grade

Objectives:

After watching these videos, students will be able to:

- Explain where our garbage goes once it leaves a home
- Understand the science that is used to create and maintain a safe landfill
- Name the natural resources that are part of a product life cycle
- Describe the difference between food scraps and food waste
- Identify different actions to reduce food waste at home
- Draw how decomposers are connected with a food web or nutrient cycle
- Describe what is necessary to maintain a home worm bin

Waste Management and the Compost Cycle Part 1: Let's talk about trash (11:29 minutes)

Join Dr. Jamie to discuss the history of solid waste management from ancient middens to modern landfills. Explore the science behind the creation of a landfill that is safe for humans and the environment.

Recommended post activities

- Create a weekly log of items that you throw away in the following categories – food, plastic, paper, metal, wood, and other. Create a chart to show how much trash is in each category.
- List who are the stakeholders in a community discussion about where to put a landfill. Write a few sentences explaining each person's point of view.
- Create a venn diagram to describe the environmental, social, and economic impacts of the food system from farm to table to landfill compared with farm to table to compost cycle.
- Write a paragraph about a past or current occurrence of an environmental injustice. Does it also connect with social injustice? How? What steps could have prevented the injustice?
- Read about the 1968 Memphis sanitation worker's strike. Who were the stakeholders in this battle and what were their points of view? What has changed in the time after this event?

If you are interested in learning more where garbage goes, you can watch "Beyond the trash can: virtual tour of Metro Central Transfer Station" at <http://oregonmetro.gov/distancelearning> (in the "Community and family education" section) or view what is happening live at the [Metro South Transfer Station trash cam](#).

To learn more about methane and the greenhouse gases, feel free to watch our [Climate Change](#) series of videos

Waste Management and the Compost Cycle Part 2: Feed yourself, not the garbage can (11:11 minutes)

Join Dr. Jamie as she learns about the difference between food scraps and food waste and brainstorms simple eco-actions that can help reduce the amount of food going to the landfill.

Recommended post activities

- Pick a favorite meal and trace where each food item came from. Create a Google map where you place a pinpoint at each location. To do this, click on the menu next to the Google maps search box (three horizontal lines), click on "My Places", "Maps", and then "Create Map" at the bottom of the screen.
- Conduct a waste audit of your kitchen garbage or create a weekly log of any food items that you threw in the garbage.
- Share with an adult or family member in your home the food waste prevention eco-action that you already do and the eco-action that you would like to try.

- Pick five food items that your families uses a lot. Research where is the best place to store them in the kitchen to reduce food waste. For example where is the best place to store milk in the refrigerator? After reading this article "[How to store food in your fridge](#)", did anything surprise you?
- Watch "[The Secret Life of Stuff](#)" video series to learn more about product lifecycles.

Waste Management and the Compost Cycle Part 3: Decomposers and the compost cycle (9:32 minutes)

Dr. Jamie explores different ways to recycle food scraps in our region and demonstrates how a home compost bins works. Learn about the important role that decomposers play in our environment and who are the stars of a worm bin.

Recommended post activities

- Watch the "Worm anatomy challenge" video and identify at least three differences between the head and the tail of a red wiggler worm
- Pick an ecosystem and create a Google slide showing how the organisms within the nutrient cycle interact with arrows. Create a story about a day or a year in your ecosystem. Take a walk to a park or stream. Take a look under rocks or fallen logs to observe decomposers in your area. Write or draw a journal entry description what you see. If you see a mushroom, take a photo and try to identify it with the "[Mushroom Identify](#)" app.
- Use the [Oregon Zoo's Food Web](#) education guide to create your own three dimensional trophic level pyramid.

If you are interested in learning more about what can be recycled besides food in our region, you can watch the "Recycle or Not game" video in either English or Spanish at <http://oregonmetro.gov/distancelearning> (in the "Community and family education" section) or play the online game at <https://www.recycleornot.org/>

Worm anatomy challenge (5:46 minutes)

Test your observation skills to figure out differences between the head and the tail of the red wiggler worm. Halfway through the presentation you can pause to write down your ideas before Dr. Jamie helps by pointing out the highlights of worm anatomy.

Four facts about worms that I learned

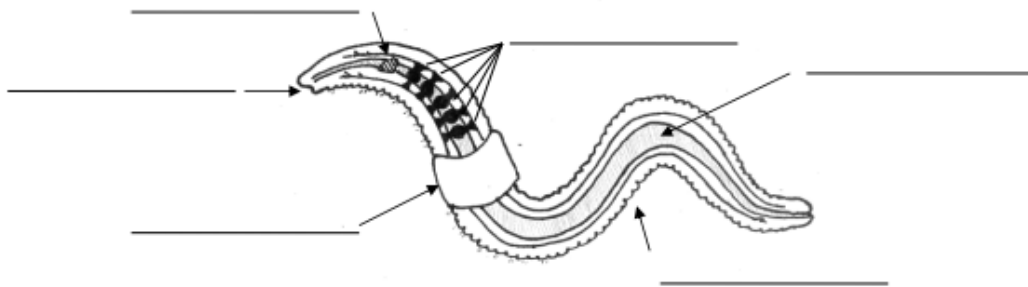


Name: _____ Date: _____

1. _____

2. _____

Use these words to label your worm: segments hearts brain
mouth clitellum intestines



3. _____

4. _____



Next Generations Science Standards

- 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 4-ETS1-2. Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- 5-PS3-1: Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- 5-ETS1-2. Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms
- MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

English Language Arts Standards

- CCSS.ELA.Literacy.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on, building on other's ideas and expressing their own clearly.
- CCSS.ELA.Literacy.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and oral (speaking and listening, comprehension and collaboration)
- 6-7.SL.1a Come to discussions prepared, having read or studied required materials; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
- 6-7.SL.1c Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
- 6-7.SL.2 Interpret information presented in diverse media and formats and explain how it contributes to a topic, text, or issue under study.
- 6-7.SL.5 Include multimedia components and visual displays in presentations to clarify information
- 6-8/WHST.6 Use technology, including the internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently

Oregon Social Studies Standards

- SS.05GE.07.02 Describe how human activity can impact the environment6.2 Describe current forms of government and the specific roles played by citizens in countries of the Western Hemisphere.
- SS.05.SA.04 Identify characteristics of an event, issue or problem, suggesting possible causes and results
- SS.05.SA.05 Identify a response or solution and support why it makes sense, using support from research 6.4 Recognize historical and contemporary means of changing societies and promoting the common good.
- 6.8 Evaluate alternative approaches or solutions to economic issues in terms of benefits and costs for different groups and society as a whole

- 6.16 Explain how technological developments, societal decisions, and personal practices influence sustainability
- 6.26 Analyze how a specific problem can manifest itself at local, regional, and global levels. Identify challenges and opportunities faced by those trying to address a specific problem.
- 6.27 Assess individual and collective capacities to take action to address local and regional issues, taking into account a range of possible levers of power, strategies and potential outcomes.
- 7.1 Describe the role of citizens in government
- 7.8 Examine how economic decisions affect the well-being of individuals, businesses, and society

National Education for Sustainability K-12 Students Learning Standards

- 2.1 Interconnectedness: Systems - Students describe the ecological, economic, political, and social systems in their community and can identify leverage points in the system to improve their community. Interdependency - Students explain how natural and built communities are part of larger systems (e.g., farms as part of the regional watershed and food systems for cities, a mine as part of the regional economy) and the interrelationships that exist among those systems.
- 2.2 Ecological Systems: Biodiversity - Students explain how the range of species and their habitats within an ecosystem interact and identify the physical environment and processes necessary for that interaction. Nature as Model and Teacher - Students investigate designs and systems in nature that can serve as models for human-created sustainable products, services, and systems.
- 2.4 Social and Cultural Systems: Multiple Perspectives - Students consider an issue or challenge related to sustainability, through a variety of lenses or perspectives and they explain how approaching that issue or challenge from different perspectives may result in different decisions and outcomes.
- 3.1 Personal Action: Personal Responsibility - Students know the difference between actions that they can take themselves and those that require the involvement of other people, organizations, and government. Problem Solving - Students identify an issue in their community and analyze it from the perspective of environmental, social/cultural, and economic concerns, brainstorm root causes, identify stakeholders, and design a solution.
- 3.2 Collective Action: Designing a Sustainable System - Using a Venn diagram, students log environmental, social, and economic impacts of a service or system that they use