sauvie island center

POST-TRIP LESSON: WORMS IN MY CLASSROOM!

Overview: Students build a worm bin for the classroom and learn how to care for it.

Sauvie Island Center Field Trip Connections: Soil and Compost, Seed to Harvest

Objectives:

Students will be able to:

- Describe what materials can and can't be added to the worm bin
- List the things worms need to survive
- Explain how keeping a worm bin can help the planet

NGSS Essential Question

- *How do organisms interact with the living and nonliving environments to obtain matter and energy?*
- *How do matter and energy move through an ecosystem?*
- *How do humans change the planet?*

Grade: *2-5*

Time: 1 hour

Location: classroom & open space (classroom with cleared desks, gymnasium, or outdoors)

Materials:

- One pound of red worms, also called red wigglers (Can be purchased at local garden store or harvested from another healthy worm bin.)
- Printed, laminated copy of "What Can I Put in my Worm Bin?" chart (Appendix B) to affix to bin
- WAMO Soil Composition Pie Chart (Appendix A)
- Ball or bean bag for Worm Bin Tag
- Worm bin (see background information)
- Newspaper or other bedding material
- Handful of soil
- Water

Background Information:

Worm composting ("vermicomposting") is a fun and easy way to recycle waste and observe decomposition in action. Worm bins require very little care, are odorless if kept properly, and can be kept right in the classroom. The worm also make great and unusual class pets! The worm bin can be a laboratory for all sorts of classroom activities, and the finished compost ("vermicompost" or "worm castings") can be used as fertilizer in the

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Background Information *cont:*

school garden or for classroom potted plants.

Students who participate in the Soil and Compost module on their Sauvie Island Center field trip will see the Center's worm bin in action. They also may learn about the four ingredients of soil (WAMO: Water, Air, Minerals, and Organic matter) and the three kinds of decomposers (the FBI: Fungus, Bacteria, and Invertebrates).

Requirements for your worm bin: Worm bins come in all shapes, sizes, and materials, but must have a lid, air holes, and drainage holes. A classroom worm bin should be at least two to three cubic feet. You can make one for free or very little money by using two large rubbermaid-style bins, stacked inside of each other. Drill holes in the bottom and sides of the inside bin, and lid. Air gets in through the top and sides, and any excess liquid drips into the bottom bin to be emptied as needed in this neat and tidy system. You can also buy a commercially made worm bin from your local garden store.

What to add to your worm bin: (See Appendix B for Chart)

- ▹ Yes: fruit and veggie scraps, egg shells, tea bags and coffee filters
- ▹ No: Cooked foods, meat, dairy, or any animal products, greasy or oil foods, or grains
- ▹ Bedding: worms need bedding like shredded newspaper or dried leaves to add structure and shelter, and to keep the bin from getting too wet and soggy.

Caring for your worm bin: Once the worm bin is created, food scraps and bedding should be added once or twice a week. Your bin might become smelly if it is overfed or is too moist. After three to six months, the finished vermicompost can be harvested and used.

Read more about making and caring for your worm bin, and find Portland-specific resources here: https://www.oregonmetro.gov/tools-living/yard-and-garden/composting/worm-composting

Find more great compost classroom activities and worm fun facts here: http://www.cvswmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvswmd1.pdf

Lesson Outline:

1. After the field trip, review the ingredients of soil (WAMO) using the soil pie chart. Review that all plants need nutrients from decomposed organic matter in the soil. Farmers and gardeners add compost back into the soil to make sure there are enough nutrients for plants to grow. Tell students that they will be making their own classroom worm bin to make compost, like the one they saw on their field trip. Ask what they remember about the worm bin:
   - **What did they find inside the worm bin?**
   - **What did the worms need to survive? Just like humans, they need food (food scraps), water, air (holes in side of bin), and shelter (paper scraps)**

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Lesson Outline *cont:*

- **What sort of food scraps did you see in the worm bin? Remind students that worms like fresh fruit and vegetable scraps, not animal products or cooked foods. Take two-three minutes to make a list as a class of different things you could add to a worm bin. (See background information and use the "What Can I Put in my Worm Bin?" chart, Appendix B)**

2. In a large open space, play worm bin tag to review what the worms can eat.
    - ▹ Have students stand in a circle. One player stands in the middle and will be "it."
    - ▹ The player in the circle holding the ball (or bean bag) names something to put in the worm bin, and then names another player, and then tosses the ball to that player. For example, "Apple core, Sophia!"
    - ▹ The person who is "it" tries to tag the player holding the ball before they toss the ball. If a player is tagged, s/he becomes the new "it."

3. Set up the worm bin:
    - Tear newspaper into thin strips for bedding. Dampen with water so it's moist as a wet sponge, then add to bin. Fill the bin ½ to ¾ full.
    - Add a handful of soil and fluff to mix. (Worms need soil because the mineral particles help them to grind their food up in their gizzards!).
    - Gently add worms in the middle of the moist bedding.
    - Add a handful or two of food scraps near your worms.
    - Cover the worms with about four inches of dry bedding.
    - Maintain the worm bin: Pull aside the dry bedding and add food scraps once or twice a week, and then cover again. If bin gets too moist, add additional bedding.

4. Review how keeping a worm bin can help our planet:

    - *The worms decompose our food scraps, which would otherwise end up in a landfill.*
    - *The finished compost can help fertilize our garden or potted plants, so we won't need to use chemical fertilizers or create pollution.*
    - *They help us reduce our waste.*

Extension Opportunities:

- ▹ Assign weekly class jobs to collect food for and take care of the worm bin
- ▹ Practice scientific method by conducting simple experiments in the worm bin.
- ▹ Investigate worm anatomy or life cycles
- ▹ Use the worm bin as an model to study ecosystems and food chains
- ▹ Harvest finished compost to use in the school garden
- ▹ Have students create brochures about worm composting for the school community

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Next Generation Science Standard Connections:

Disciplinary Core Ideas:

▪ **Life Science 2.A: Interdependent Relationships in Ecosystems** *How do organisms interact with the living and nonliving environments to obtain matter and energy?*

▹ The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

▪ **Life Science 2.B: Cycles of Matter and Energy Transfer in Ecosystems** *How do matter and energy move through an ecosystem?*

▹ Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

▪ **Earth Space Science 3.C: Human Impacts on Earth Systems** *How do humans change the planet?*

▹ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)
▹ Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

Science and Engineering Practices:

▪ **Planning and Carrying Out Investigations**

▹ Planning and carrying out investigations in grades K-2 involves making observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.
▹ Planning and carrying out investigations in grades 3-5 progresses to include making observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

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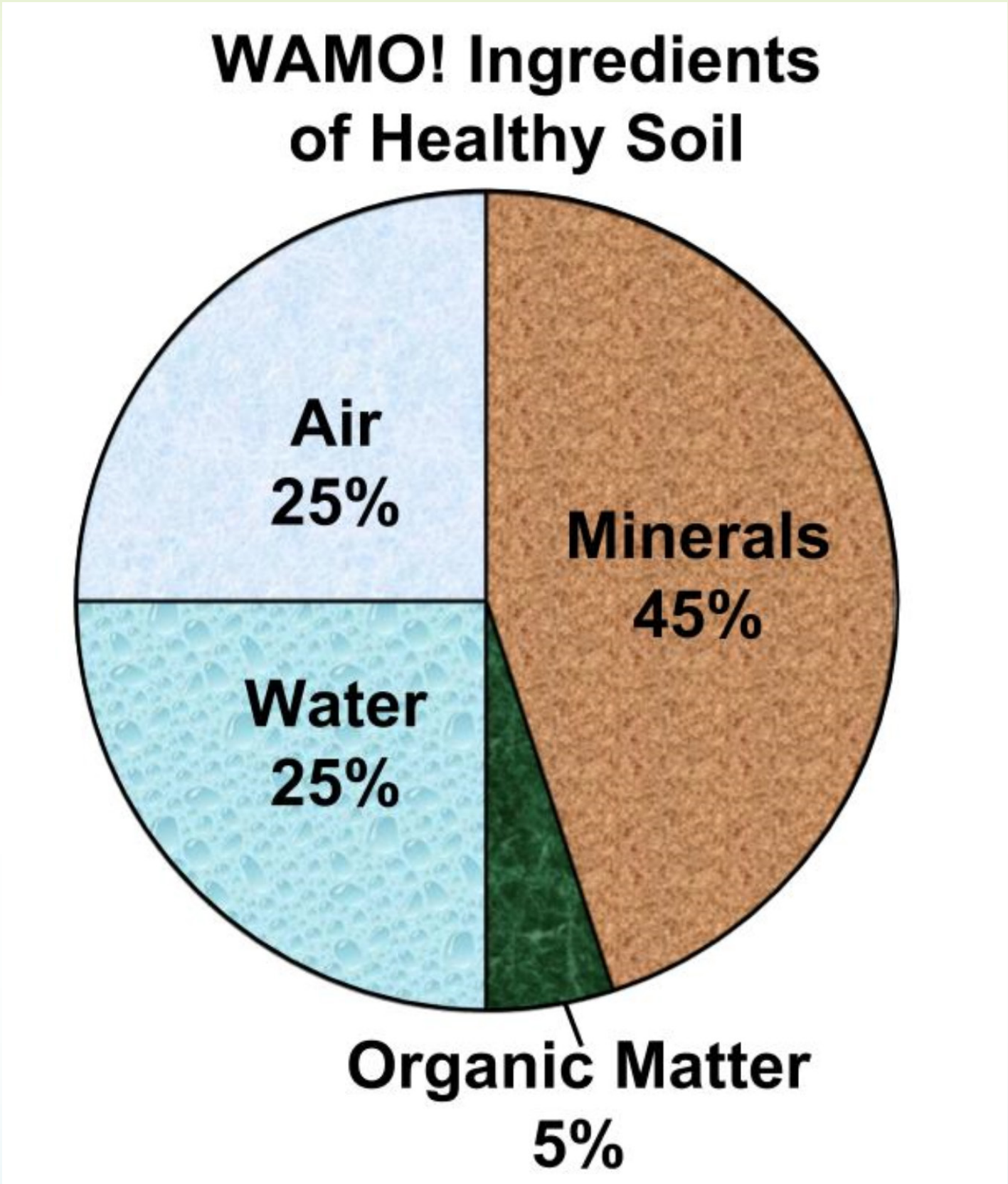
Appendix A: WAMO Soil Composition Pie Chart



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Appendix B: What Can I Put in my Worm Bin?