

Rot On! A unit on Composting and Worms

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Pomfret Grades $\frac{3}{4}$

Essential Questions –

- What is the difference between a biodegradable and non-biodegradable material?
- Is there any part of our snack or lunches that cannot be tracked back to the earth?
- What can be composted, recycled, reused, or sent to the landfill?
- What is the role of decomposers in the food web?
- How can we reduce the amount of biodegradable materials being sent to the landfill?
- How are worms and composting related?
- What are the physical and behavioral characteristics of worms?
- How does a worm's anatomy contribute to its survival?
- What can we learn about worms through preference trials?
- How can we meet the needs of worms in a man made habitat?

S3-4:30

(DOK 2)

Students demonstrate their understanding of Structure and Function–Survival Requirements by...

- **Explaining** how the **physical structure/characteristic** of an organism allows it to **survive** and defend itself (e.g., The coloring of a fiddler crab allows it to **camouflage** itself in the sand and grasses of its environment so that it will be protected from **predators**. A rose is protected by its thorns).

Science Concept:

a. Organisms have **physical characteristics** that help them to **survive** in their environment. These **structures** enable an organism to:

- Defend itself,
- Obtain food,
- Reproduce,
- Eliminate waste.

S3-4:31

(DOK 2)

Students demonstrate their understanding of Reproduction by ...

- Investigating and describing a variety of plant and animal **life cycles**.

Science Concept:

a. Although all organisms have common stages of development, details of a **life cycle** are different for different organisms

S3-4:34

(DOK 1)

Students demonstrate their understanding of Energy Flow in an Ecosystem by...

- Identifying the source of **energy** for the **survival** of

Science Concept:

a. **Energy** derived from food is needed for all organisms (plants and animals) to stay alive and grow.

<p>S3-4:35 (DOK 3) Students demonstrate their understanding of Food Webs in an Ecosystem by...</p> <ul style="list-style-type: none"> • Recognizing that, in a simple food chain, all animals' food begins with plants. <p>AND</p> <ul style="list-style-type: none"> • Researching and designing a habitat and explaining how it meets the needs of the organisms that live there. 	<p>Science Concept:</p> <ol style="list-style-type: none"> a. Food for animals can be traced back to plants. b. Organisms can survive best only in habitats in which their needs are met.
<p>S3-4:36 (DOK 2) Students demonstrate their understanding of Equilibrium in an Ecosystem by...</p> <ul style="list-style-type: none"> • Explaining how one organism depends upon another organism to survive. 	<p>Science Concept:</p> <ol style="list-style-type: none"> a. Organisms interact with one another in various ways besides providing food (e.g., Many plants depend on animals for carrying their pollen to other plants for fertilizing their flowers).

<p>S3-4:46 (DOK 2) Students demonstrate their understanding of Processes and Change over Time within Earth Systems by...</p> <ul style="list-style-type: none"> • Observing, identifying and comparing components of soils and rocks. <p>AND</p> <ul style="list-style-type: none"> • Recognizing and identifying the four basic materials of the earth (i.e., rocks, soil, water, and gases). <p>AND</p> <ul style="list-style-type: none"> • Observing and comparing the properties of rocks. 	<p>Science Concepts:</p> <ol style="list-style-type: none"> a. Soil is made partly from rock, partly from plant remains and also contains many living organisms. b. Earth materials are solid rocks, soils, water and the gases of the atmosphere. c. Rock is composed of different combinations of minerals. Large rocks can be broken down into small rocks. d. Rocks have properties of color, texture and hardness. Rocks can be classified by their physical properties.
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<p>S3-4:49 (DOK 2) Students demonstrate their understanding of Processes and Change within Natural Resources by...</p> <ul style="list-style-type: none"> • Observing and describing properties of living and nonliving resources. <p>AND</p> <ul style="list-style-type: none"> • Explaining how the properties of living and non-living resources make them suitable for use by humans. 	<p>Science Concepts:</p> <ol style="list-style-type: none"> a. The varied earth materials have different physical and chemical properties which make them useful in different ways, for example, as building materials, as sources of fuel, for growing the plants we use as food, or supporting animal life. Earth materials provide many of the resources that humans use. b. Earth materials have chemical and physical properties that make them useful as building materials, for growing plants, or for fuel.
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Assessments of Learning

- Compost posters and accompanying presentations to other classes
- Worm posters
- Worm Test

Overview of Daily Instruction

Composting

Day 1 – Essential Question – What is the difference between a biodegradable and non-biodegradable material? (Jenny)

“What is Biodegradable” (“Do the Rot Thing” pg 3) – Students list examples of all the things they throw away, learn that biodegradable means to decay, and then sort these materials into recyclable, biodegradable, and trash. (Jenny)

Day 2 – Essential Question – Is there any part of our snack or lunches that cannot be tracked back to the earth? (Jenny)

“Dirt for Lunch” (“Do the Rot Thing” pg 4–5) – Students trace the origins of their snacks and lunch back to the earth. For example, bread comes from wheat, which is grown in soil. (Jenny and Jon)

Day 3 – Essential Question – What can be composted, recycled, reused, or sent to the landfill? (Jenny and Jon)

“Environmental Lunch” (“Do the Rot Thing” pg 6–8) – Students sort lunch and snack food and packaging materials into buckets labeled Compost, Recycle, Reuse, and Landfill

Day 4/5 – Essential Question – What is the role of decomposers in the food web?

“Decomposition Tag” (“Do the Rot Thing” pg 9–10) – Students play a tag game that illustrates the role of decomposers in the food web. (Jenny)

Read Aloud – Compost Critters by Bianca Lavies

“Compost Critters” (“Do the Rot Thing” pg 14–17) – Students use toothpicks and magnifying glasses to examine compost, looking for decomposers. (Jon and Jenny)

Days 6–12 and ongoing – Essential Question – How can we reduce the amount of biodegradable materials being sent to the landfill?

Part 1 – Students and teachers will build a 3-bin compost system using pallets and hardware cloth. The design is based on pg. S-7 of Scraps to Soil: A How to Guide for School Composting.

Part 2 – Working in teams, students prepare posters about composting (Why compost? What can be composted? What cannot be composted? How does the system work in the classroom? How does the system work in the lunchroom?) Then they make a presentation to each class in the building. (Jon)

Part 3 – As a whole, the class build the compost pile, alternating greens (organic material such as food scraps) and browns (fallen leaves, hay, wood chips) (Jenny and Jon)

Part 4 – Students maintain the compost pile by collecting compost from each classroom, the lunch room, and staff room, adding it to the compost pile, mixing in browns, and turning the pile. (Jon)

Worms

Day 1 – Essential Question – How are worms and composting related?

“The Worm Who Came to Dinner” (Worms Eat Our Garbage pgs. 56–59) This is a reading comprehension activity that draws the link between composting and raising worms to decompose household scraps.(Jenny)

Day 2 – Essential Question – What are the physical and behavioral characteristics of worms?

“Warming Up to Worms” (Critters – AIMS pgs. 40–42) Using purchased nightcrawlers, students explore the characteristics of worms. (Jenny and Jon)

Day 3 – Essential Question – How does a worm’s anatomy contribute to its survival?

“Lumbricus terrestris” (Critters – AIMS pgs. 44–47) Using a “jigsaw” cooperative learning group, students read technical information about worm anatomy, reproduction, and movement. They then teach a new group what they learned. (Jenny and Jon)

Day 4 – Essential Question –Can we learn more about worms through preference trials?

“Wiggle Worms” (Project Seasons pgs. 91–92) Students set up preference trials to determine if worms prefer dark to light, moist surfaces to dry, etc. (Jenny and Jon)

Day 5 – Essential Question – How can we meet the needs of worms in a man made habitat? (Jenny)

Day 6 – Review (Jon)

“Wormania” video – The “Worm Lady” teaches worm anatomy, reproduction, why raising worms is helpful to the environment, how to set up a worm bin, and other interesting facts about worms. (Jenny and Jon)

Day 7– Assessment #1 Worm Test (see attached) (Jenny and Jon)

Days 8–9 – Assessment #2 Worm Posters (see attached checklist) (Jenny and Jon)

Supporting Resources

Songs:

Banana Slug String Band Singing in Our Garden <http://www.BananaSlugStringBand.com>

Videos:

“Wormania” by Mary Appelhof

Nonfiction Picture Book Read Alouds

Compost! Growing Gardens From Your Garbage by Linda Glaser

Compost Critters by Bianca Lavies

Composting: Nature’s Recyclers by Robin Koontz

Instructional Resources:

Critters, an AIMS publication

“Do the Rot Thing: A Teacher’s Guide to Compost Activities” PDF file available from Central Vermont Solid Waste Management District <http://www.cvswwmd.org>

Project Seasons – Shelburne Farms publication

Scraps to Soil: A How to Guide for School Composting, published by Association of Vermont Recyclers

Worms Eat Our Garbage: Classroom Activities for a Better Environment By Mary Applehof et al

Literature Connections:

How to Eat Fried Worms by Thomas Rockwell

How to Eat Fried Worms activity packet and “The Bet No One Could Lose” – play performed as a Readers’ Theater both resources created by Sundance Publishers