

OIMB GK12 CURRICULUM

3rd Grade

45 – 60 minutes

WONDERFUL WORMS

Oregon Science Content Standards:

3.1 Structure and Function: Living and non-living things vary in their characteristics and properties.

3.1L.1 Compare and contrast the characteristics of offspring and parents.

3.2 Interaction and Change: Living and non-living things interact with energy and forces.

3.2L.1 Compare and contrast the life cycles of plants and animals.

3.3 Scientific Inquiry: Scientific inquiry is a process used to explore the natural world using evidence from observations and investigations.

Ocean Literacy Principles:

5. The ocean supports a great diversity of life and ecosystems.

Goals:

- Students observe, compare and contrast earthworms and sea worms.
- Students examine differences in these worms' adaptations and ecology

Concepts:

- Worms are a diverse group of animals.
- Worms are adapted to live in many different environments and have different body parts to help them survive in different habitats.
- Earthworms and sea worms have body-shape similarities, but also differences related to their different habitats and food preferences.
- Live animals should be handled and observed with care.

Materials:

- Worksheet (1 per student)
- Petri dishes, or other small containers (2 per pair of students)
- Pieces of moistened paper towel (to line half of the containers)
- Earthworms (1 per student pair) preferably nightcrawlers, sold at bait stores
- Sea worms (1 per student pair) e.g. *Nereis sp.* which can be collected at the Portside mudflat (with permit, return after observations)
- Cold seawater
- Magnifying glasses (1 per student or pair of students)
- Optional PowerPoint showing different worms

OIMB GK12 CURRICULUM

Background:

The Phylum Annelida includes the segmented worms and leeches. This phylum is split into 3 classes, the largest of which is the Polychaeta (many hairs) to which most of the segmented worms in the ocean belong. Earthworms are in the class Oligochaeta (few hairs), and the leeches belong to the class Hirudinea. Nereis are a great example to show how sea worms move, and also have large eyes. Nephthys are very active swimmers and biters, so both are very interesting to observe in the classroom (keep fingers away from the latter).

Earthworms live in the dirt. For the most part, they “eat soil”. They actually get nutrition from the bacteria, fungi, algae and other organic matter in the dirt. What is not digested is excreted and called “castings”. By moving through the soil and having soil move through them, earthworms help gardens by aerating the soil. Earthworms breathe through their skin. They are hermaphroditic (one worm is both sexes) and lay eggs in the soil in a cocoon made from the clitellum (noticeable band around the earthworm’s body, near the head end). A pair mate and both worms will lay eggs. Earthworms hatch from the cocoon as juveniles (mini-adults) and immediately take to the adult habitat (eating soil). Earthworms have tiny bristles, chaetae or setae that are often pulled inside their body. They use their strong musculature and setae to move through soil. To move forward or backward, they stretch out one end of their body, stick out the setae to anchor that end, and then pull up the other end. Many birds eat earthworms.

Sea worms mostly have separate sexes (boys and girls). They can either lay eggs on the bottom or release eggs in the water where they drift away. Some eggs hatch as little worms that immediately start crawling just like the adults, but most have a swimming larval stage. The larvae swim and eat and then settle down on the bottom and are then recognizable as worms. Many sea worms are predators or omnivores, feeding on small invertebrates, other worms and algae. Some are found in burrows in mud flats, others in rocky areas, and some in the deep sea. Sea worms are often eaten by fish and crustaceans.

Lesson plan:

1. Ask what students already know about worms, both on land and in the water. Create a KWL chart about worms. Alternatively, start by reading a book about worms (e.g. *Wonderful Worms* by Linda Glaser, *Diary of a Worm* by Doreen Cronin). Show the included PowerPoint on worms either now or at the end of the lesson.
2. Explain to the students that today we will compare earthworms and sea worms. We want to practice making good observations. We want to know what the

OIMB GK12 CURRICULUM

worms look like, how they move, etc. Explain that they will fill out a worksheet scavenger hunt—they will look for different body parts on live worms and try to match those body parts to drawings of earthworms and sea worms.

3. Discuss how to handle live animals (1 finger touch rule, no poking or picking them up, 1 person at a time). Write out these and other rules on the board or post a class-made poster of rules.
4. Pass out magnifying glasses and earthworms (put earthworms in a petri dish with a moistened piece of paper towel).
5. While students are observing the worms:
 - draw a picture of an earthworm on the board (similar to the handout)
 - have students go up to the board and ID major body parts: head, tail, segment, trunk (trunk = body), clitellum
 - walk around and ask students about their observations
 - point out that earthworms live underground so there is not a lot of light for them to see and they lack eyes
 - they also eat dirt, so don't need large jaws or eyes for hunting
 - prepare sea worms by placing them in individual containers with a small amount of seawater
6. After some time, pass out sea worms and allow students to observe both types of worms side by side.
7. Collect earthworms first and then sea worms. Pass out the worksheets.
8. Go over the worksheets together, starting by referencing the earthworm picture drawn on the board. Point out that the earthworms will not have all of the body parts listed, nor will the sea worms. They will each have some of the same, as well as different features. Ask students what similarities and differences they saw between the worms.
 - *An obvious difference between earthworms and sea worms are the number and visibility of bristles.*
 - *Earthworms have a clitellum, a thickened band whose function is to secrete the egg sac.*
 - *Chaetae (pronounced set-ee)- hairs/bristles made of chiton found on annelid worms (movement and sensory functions)*
 - *Parapodia- side feet for burrowing, walking or swimming*
 - *Gills- found in between parapodia, used for breathing oxygen in water*
 - *Eyes-to help with finding food and swimming*
 - *Tentacles – also sensory*

Answers:

Earthworm 1. Head, 2. Clitellum, 3. Segment, 4. Tail, 5. Trunk

Sea worm 6. Head, 7. Segment, 8. Gills, 9. Chaetae, 10. Parapodia, 11. Tail, 12. Trunk, (some species will also have obvious eyes and tentacles).

OIMB GK12 CURRICULUM

9. Using the background information, go over the questions about earthworms and sea worms at the bottom of the worksheet pages.
10. Review the words herbivore, carnivore and omnivore:
Herbivores eat plants and algae.
Carnivores eat other animals.
Omnivores eat both plants algae and other animals.

Tips:

- Emphasize differences in ecology and adaptations.
- Release earthworms into garden when finished; Return sea worms.

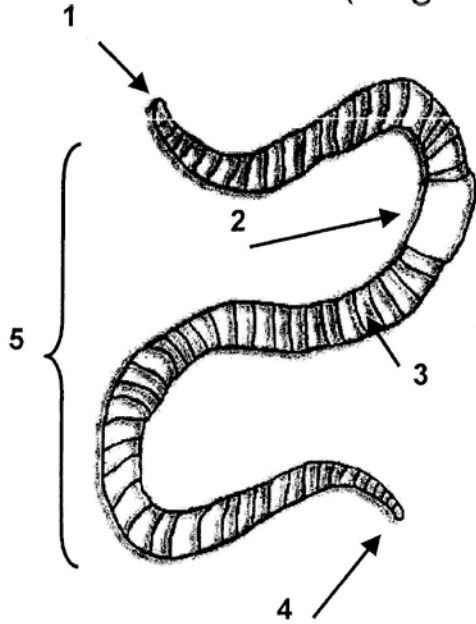
Assessment: students' verbal identification of structures, discussion, and completion of worksheet

GK12 Fellows: Tracey Smart, Erin Morgan and Kira Treibergs

OIMB GK12 CURRICULUM

Name: _____

Earthworms (Oligochaetes)



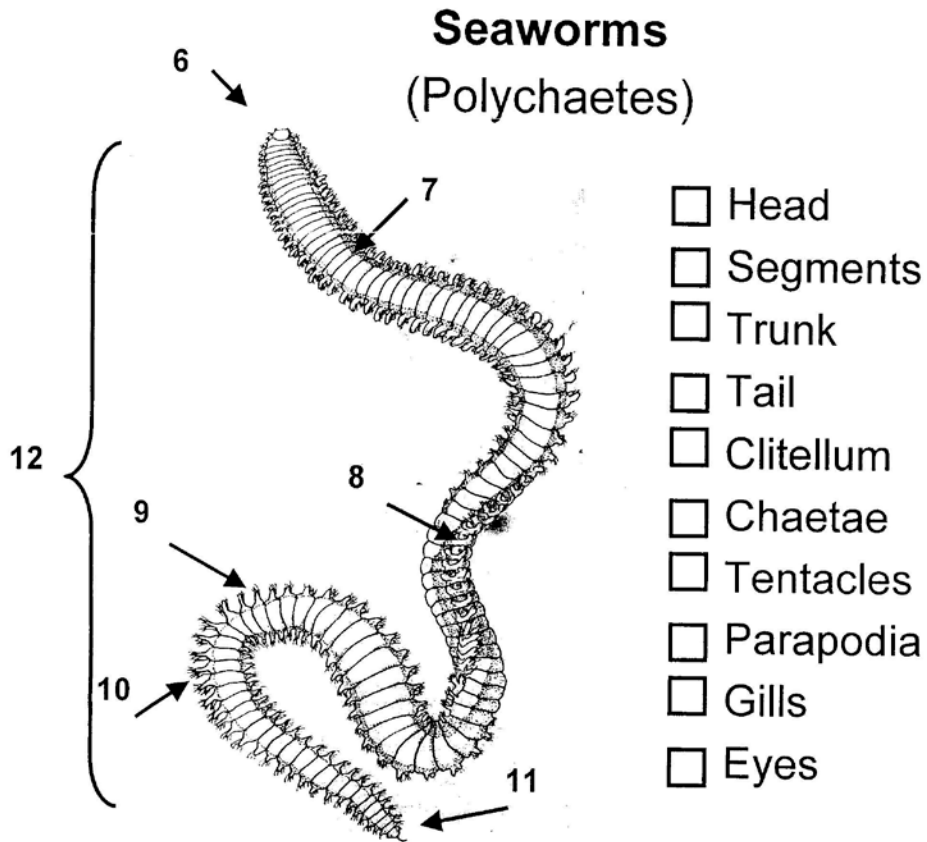
- Head
- Segments
- Trunk
- Tail
- Clitellum
- Chaetae
- Tentacles
- Parapodia
- Gills
- Eyes

Where do earthworms live?

What do earthworms eat?

How do earthworms move?

What eats earthworms?



Where do seaworms live?

What do seaworms eat?

How do seaworms move?

What eats seaworms?