

How earthworms work

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Earthworms wriggle in the dirt, breaking up soil. They are trash collectors and farmers, allowing plants to grow. Photo by: Creative Commons

Just going about their own daily lives, earthworms provide vital benefits for local plants and animals. First and foremost, they carry out most of the decomposition of the leaves and litter that fall to the woodland floor.

Worms are eating machines. On the forest floor, redworms munch organic matter in any state of decomposition. Beneath the surface, earthworms like nightcrawlers eat leaves pulled into their burrows.

As a worm consumes the organic matter, it breaks it down into smaller parts. This releases nutrients locked up in the leaf. The worm absorbs some, but not all, of these nutrients for itself. The castings excreted by earthworms are packed with nitrogen. This is a key element needed to sustain plant growth.

Earthworms absorb only about 27 percent of the available nitrogen in their food. This leaves the other 73 percent broken down and available as nutrients in the soil. Charles Darwin calculated that 10 years worth of worm castings from an acre of soil collected and spread evenly over that acre would form a layer that is 2 inches (5.08 centimeters) thick.

Earthworms also perform other services for its local ecosystem. You know how rainwater has a tendency to seep into the ground? You can thank deep-burrowing worms for that. As anecic worms like nightcrawlers move vertically to the ground, the mucus they produce not only helps them move more easily through dirt. It also acts as a stabilizer, kind of a slimy cement that helps maintain the structural integrity of the burrow. These burrows prevent flooding by also acting as channels for rainwater to percolate through the soil. This acts like a filter, cleaning out impurities as the water trickles down to aquifers and other reservoirs.

These same channels also put air into the soil. It allows plants' roots to move into areas that would otherwise be too compacted had earthworms not already burrowed through it.

Tilling the soil is also a major service that earthworms perform. Deep burrowers move soil upward and downward. They distribute nutrients more efficiently, breaking up compact soil and aerating it. Topsoil dwellers break up minerals in the soil and mix it together as well. You can kind of think of earthworms as natural earth movers. Aristotle once called them, "the intestines of the soil".

Quiz

- 1 If an earthworm eats enough matter that it consumes 100 grams of nitrogen in its lifespan, how much nitrogen did it release into the soil?
- (A) 10 grams
 - (B) 27 grams
 - (C) 73 grams
 - (D) 100 grams

- 2 Read the conclusion below.

The burrows created by earthworms keep water from building up above the ground.

Which sentence from the article provides the BEST support to the statement above?

- (A) It also acts as a stabilizer, kind of a slimy cement that helps maintain the structural integrity of the burrow.
 - (B) These burrows prevent flooding by also acting as channels for rainwater to percolate through the soil.
 - (C) This acts like a filter, cleaning out impurities as the water trickles down to aquifers and other reservoirs.
 - (D) It allows plants' roots to move into areas that would otherwise be too compacted had earthworms not already burrowed through it.
- 3 How do earthworms make rich soil for better crops?
- (A) They produce a mucus that coats their burrows.
 - (B) They move nutrients as they make burrows underground.
 - (C) They allow rain to soak into the ground through their burrows.
 - (D) They till the soil and pack the soil to prevent air from moving through it.

- 4 One conclusion a reader could make after reading the article is that the slimy mucus on earthworms is useful to them.

Which of the following statements accurately paraphrases evidence from the article to support the conclusion?

- (A) It helps them to make their castings more easily and gives nutrients to the plants where they leave their castings.
 - (B) It helps them to make their burrows more easily and keeps their burrows glued together to keep it from caving in.
 - (C) It helps them to stop flooding by leaving their sticky substance on the burrows so the water will not enter.
 - (D) It helps them to break down dead leaves and other materials so that they can help with the decomposition process.
- 5 Based on the context of the article, what is the best definition of an "anecic worms," like nightcrawlers?
- (A) It means that nightcrawlers decompose material.
 - (B) It means they put air and nutrients into the soil.
 - (C) It means they make vertical underground tunnels.
 - (D) It means they excrete worm castings that contain nutrients.

- 6 Which sentence from the article BEST introduces earthworms to the reader?
- (A) Just going about their own daily lives, earthworms provide vital benefits for local plants and animals.
 - (B) First and foremost, they carry out most of the decomposition of the leaves and litter that fall to the woodland floor.
 - (C) On the forest floor, redworms munch organic matter in any state of decomposition.
 - (D) Beneath the surface, earthworms like nightcrawlers eat leaves pulled into their burrows.
- 7 Why did Aristotle call earthworms, "the intestines of the soil"?
- (A) He determined that 10 years worth of worm castings can cover an acre of land 2 inches thick.
 - (B) He observed that earthworms were able to break down and move nutrients through the soil.
 - (C) He calculated the percent of each element and nutrient present in whatever the worms pooped out.
 - (D) He was describing how the mucus that worms produce is used to decompose organic matter in the soil.
- 8 What is MOST likely the reason the author included the information about Charles Darwin's calculations?
- (A) to highlight the first scientist to seriously study earthworms
 - (B) to suggest that earthworms can cause problems for the ecosystem
 - (C) to explain how earthworms make space for plants' roots to grow
 - (D) to emphasize the importance of earthworm castings for the soil