More Than Just Bait

What do you get when you cut a blackworm in half?

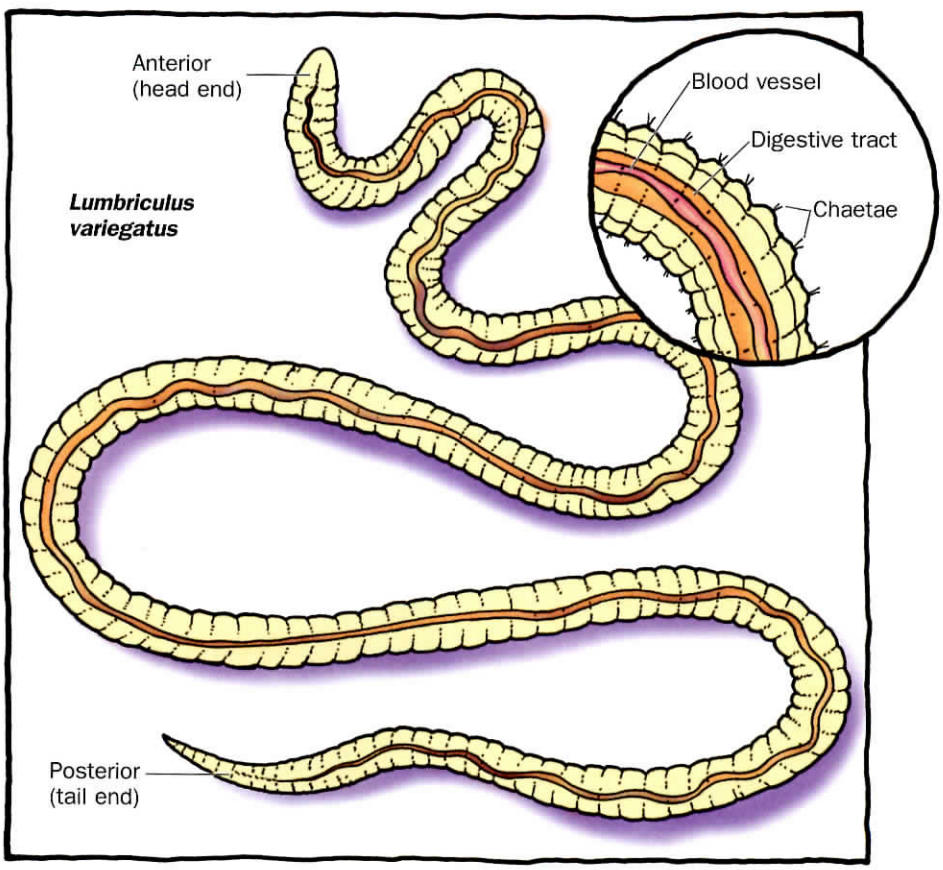
A. One dead worm
B. Two live worms
C. A bloody mess

Strangely, the answer is B. This amazing worm, whose scientific name is *Lumbriculus variegatus,* can be cut into several fragments—and it won't die or even bleed. Instead, it regenerates a new head or tail, or both, from the various pieces.

What's more amazing is that the blackworm is not a rare animal living in some faraway place. Usually no more than 10 centimeters long, this worm lives in the shallow edges of ponds, marshes, and lakes throughout North America and Europe.

Despite its short length, a mature blackworm has between 150 and 250 body segments. Even a fragment of blackworm only a few segments long can regenerate lost body parts—fast. In fact, fragmentation, followed by regeneration, is much more common than sexual reproduction in blackworms.

"The segments regenerate quickly," says Dr. Charles Drewes, a zoologist who has studied blackworms for many years. "For example, a new head or tail usually develops within 2 to 3 weeks. The new segments—usually eight for a head and between 20 and 100 for a tail—are smaller and paler than the original ones."



Basic anatomy of an adult blackworm

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You can tell that the anterior end of this blackworm has undergone regeneration because of its pale color.

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Note the lighter color of the regenerated head and tail ends of these blackworms.

A Worm With a Rapid Reflex

The blackworm "swims" by twisting its body through the water in a corkscrew fashion. If the water in which it lives is shallow enough, a blackworm will stretch its tail to the surface of the water. It then bends its tail at a right angle so that a few centimeters of its dorsal surface is lying just above the water's surface. Part of the tail now faces skyward and is exposed to air. Although this is a good position for gas exchange of oxygen and carbon dioxide, it exposes the blackworm's tail to its enemies.

To offset the problem of the tail's exposure, the worm uses a special rapid escape reflex. The tail end rapidly shortens in response to a threatening enemy. This reflex can be triggered by touch, a vibration, or even by the sudden appearance of a shadow. Nerve cells, called "photoreceptors," which are able to detect these shadows, are located in the blackworm's tail.

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If you look closely, you can make out the tail of a blackworm bent to be parallel to the surface of this pond.

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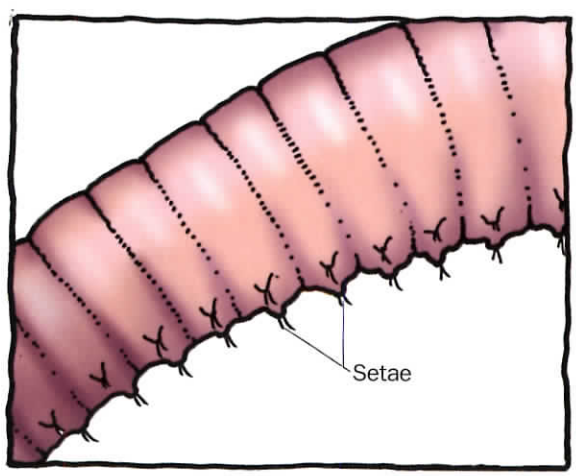
The bulge around the earthworm near its center is called the clitellum. It produces mucus that forms a cocoon for the worm's eggs.

It's All in the Family

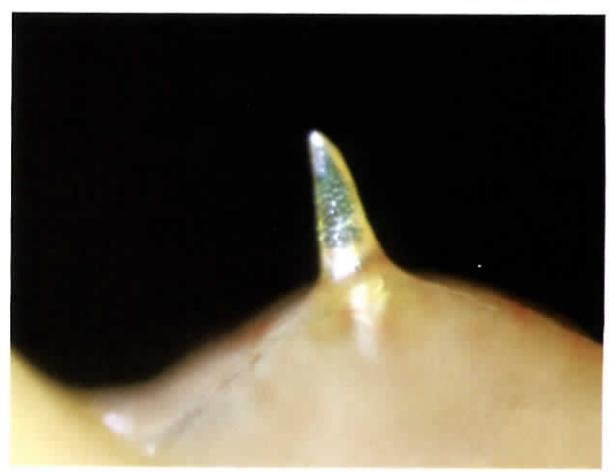
If you haven't seen a blackworm in the wild, you've likely seen its relative, *Lumbricus terrestris,* the common earthworm. It, too, lives throughout North America and Europe—but in the soil. It can grow up to 25 centimeters long, and like the blackworm, it has the gift of regeneration.

A mature earthworm has about 150 segments. It also has a light-colored bulge on its body, called the clitellum. If an earthworm is cut in two, only the part with the clitellum can regenerate. The part without the clitellum will die.

The next time you see an earthworm, look for its clitellum. Look even more carefully and you'll also see tiny hairs on each segment of its body. These hairs, called setae (SEE-tee), help earthworms move by giving them many tiny grips on the soil. In blackworms, similar hairs are referred to as chaetae.



These tiny hairs help the earthworm cling to the soil as it moves.



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This magnified photo of an earthworm's seta allows you to see its actual structure.

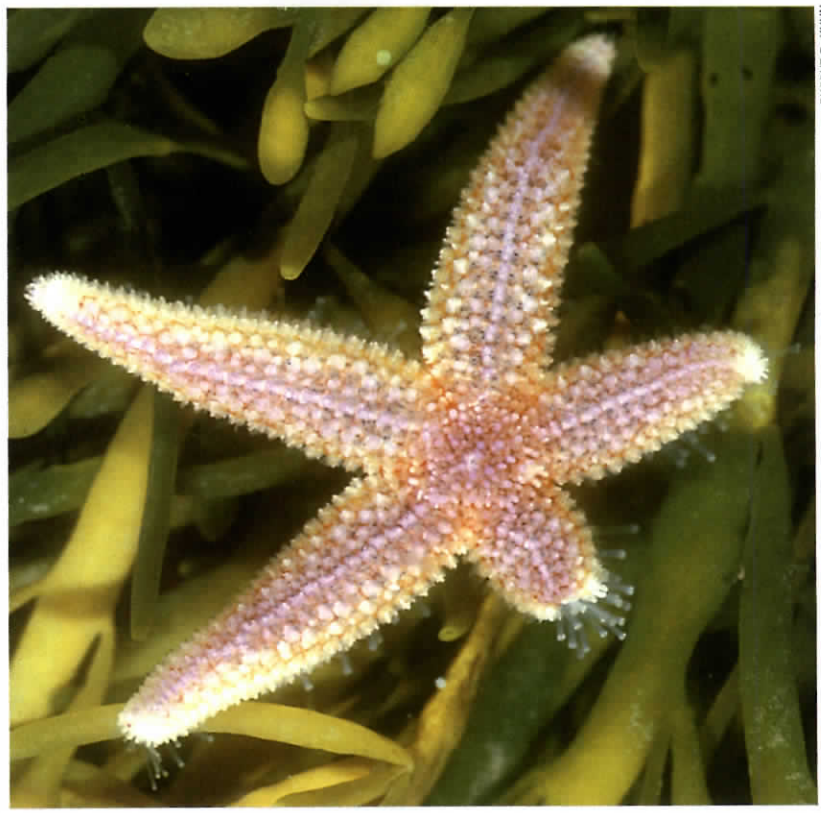
Earth Movers

Earthworms have remarkable regeneration powers, and they are also terrific diggers. These mini-bulldozers actually plow and fertilize soil!

Here's how: First, they eat bits of soil, decaying leaves, and bacteria and other microorganisms. (Each bite enlarges their network of underground tunnels.) With digestive systems the length of their bodies, they next grind and mix their food. Then they expel their waste, called castings, which is actually first-rate, nutrient-rich soil. Throughout this process, these tiny farmers till the earth by bringing subsoil to the surface. That's not all! Their tunnels give air and water easy access to the roots of plants, helping them to grow.

Both blackworms and earthworms are amazing animals that deserve our respect. So while we may have to look down to find them, we should never look down on them. □

Are blackworms and earthworms the only two organisms that can undergo regeneration? Hardly! Another amazing regeneration story belongs to the starfish. A starfish can grow a new arm, or ray, if it loses one. A few starfish species can even regenerate an entire body from a single ray. In some cases, several starfish can result from one starfish that gets cut into pieces.



DWIGHT R. KUHN

The shape of this starfish will become more typical as its parts regenerate fully.