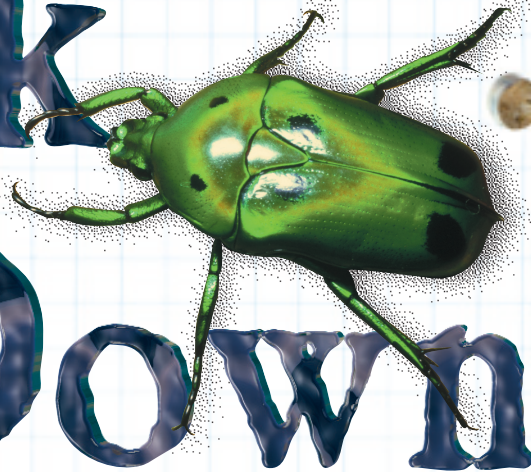


Break it Down



**“The smallest creatures men despise,
Beetles, ants, gnats, and butterflies,
And worms that from corruption come,
Finding in carcasses a home.”**

*FROM THE ROMANCE OF THE ROSE,
by Guillaume de Lorris and Jean de Meun, circa 1225–1230.*

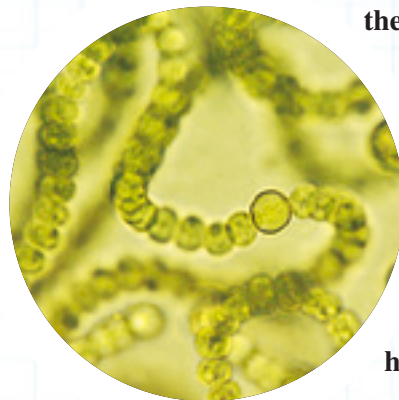
One of the most important links in a food chain belongs to decomposers. Decomposers break down the remains of dead organisms, such as plants and animals, and in the process release important nutrients back into the environment. Beetles, flies, cockroaches, bacteria, and fungi are all part of the decomposition process. Without them, hundreds of dead animals would be laying around and fallen leaves would be piled as high as mountains.

Decomposers recycle oxygen, carbon, and nitrogen. Carbon from dead and rotting organisms would wipe out carbon dioxide in the atmosphere if decomposers weren't around. Without carbon dioxide, plants wouldn't be able to photosynthesize, and ecosystems would quickly die. So those nasty little decomposers are actually good for Earth.

Bacteria Hysteria

Thousands of types of bacteria exist on Earth.

If all bacteria survived, there would be a huge number of new bacteria cells every six hours. Bacteria can reproduce every 20 minutes. At this rate, in 43 hours, there would be enough bacteria to take up the entire volume of Earth. In



45 hours, the bacteria would weigh as much as the Earth: 6,600,000,000,000,000,000 tons (6.6×10^{21} tons). Luckily, that doesn't happen. Most bacterial cells die quickly. Why? Competition for food and space.

Decomposing bacteria may release chemicals into the dead organisms and use the cadaver as food. The bacteria then absorb some nutrients and release the rest into the air or soil—giving energy for new plant growth.

Ready, Set, Rot

ITEM	ROT TIME
Fruit and veggie scraps	a few weeks to 6 months
Cotton or paper	6 months
Dead leaves	6 months to 2 years
Plastics	up to 500 years
Aluminum cans	200 to 500 years

Even though there are 2.5 billion bacteria in one gram of soil, you may never see a single bacteria in your entire life. If you lined up 10,000 bacteria side by side, it would take up less than one inch and could only be seen under a powerful microscope.

Decay This Way

Fungi live in every ecosystem throughout the world. Estimates suggest that over 1.5 million species of fungi exist, but less than 5 percent of fungi have been identified by scientists. Fungi break down matter in lots of different ways.

Fungi called saprophytes break down dead matter the same way bacteria do—and help out in decomposition. They get their nutrition by living in or on a food supply. When their food supply runs out, they just spread into new food and feed off that. Saprophytes can be the nasty culprits that spoil food and ruin fabrics and wood.

Some fungi are parasites, and they feed on living things—and usually harm them. Fungi found on humans—such as athlete's foot fungus—are parasites. Parasitic fungi break down living tissue in an organism. If they break down enough tissue, those organisms may eventually die.

Other types of fungi grow around plant roots and bring up water for the plant to use in photosynthesis. They also break down minerals in the soil for the plant, which helps the plant grow and provide food for other organisms.

ROTTING HEAP

Want to see decomposition in action? Make some compost. A compost pile helps the environment and promotes natural decay. As stuff in the pile decomposes, nutrients are released into the atmosphere and the soil. Only organic materials, such as leaves, fruit and vegetable scraps, grass and other natural matter, can be put into this scrap heap.

Here's how to make a good compost pile:

- 1 Collect leaves, twigs, and grass from your schoolyard or backyard at home.
- 2 Put fruit and vegetable scraps into a blender to grind them up. If you have any coffee grounds, eggshells, or nutshells, add them to the mix. Don't add meat, fish, dairy products, or animal fat.
- 3 Find a good spot outside that's protected from heavy winds, rain, and too much sunlight. Also, find a spot that won't offend your neighbors and one that your cat or dog can't get to.
- 4 Begin the pile with a 4-inch layer of leaves. Add 2 inches of grass and twigs. Add the kitchen scraps on top.
- 5 Using a shovel, mix the pile around. That helps spread nutrients and oxygen around.
- 6 Sprinkle the pile with water, but don't get it soggy.
- 7 Cover the pile with a black plastic garbage bag.
- 8 The pile will start to heat up. The heat will allow bacteria and fungus to start their decomposing deeds.
- 9 Turn or mix the pile every three to six days.
- 10 When the pile stops heating, the compost is done. Finished compost is dark brown, crumbly, and smells earthy. It usually takes two weeks to four months for a compost to finish. When it's done, it can be added to soil; its minerals will help plants grow.