

Rotting Is a Good Thing!

Have you ever seen rotting food? Did it look like these pictures of a piece of moldy bread and a rotten lemon? Would you want to eat this piece of bread? NO!



Photo courtesy of Dezidor/Wikimedia



Photo courtesy of Pixabay.com

We usually think that rotting is a bad thing because we can't eat rotten food. Rotting things can also smell yucky. But sometimes rotting is a **good** thing. Keep reading to find out why!

Look at the pictures of the rotting lemon and bread above. What is the stuff on top that's gray and white and blue and black? What do you think this weird-looking stuff is doing?

You may have heard people call this stuff **mold**. But what is mold?

What Is Mold?

There are many kinds of mold. That's why you see different colors on the lemon and the bread. This colored, powdery material is made up of millions and millions of tiny mold organisms. If you wanted to see just one mold organism, you would need a microscope. Here's what one type of mold looks like under a microscope:



Courtesy of Ramy Algayar,
Wikimedia Commons

These mold organisms look like tiny plants. In fact, scientists used to think they were plants. But then scientists found evidence that mold organisms can't make their own food like plants do. This means they can't be plants. But they aren't animals either. So what are they?

Molds belong to a special group of living things called **fungi** that get their food in a unique way.

How Do Mold Organisms Get Their Food?

The mold organisms we just saw in the photos are using the bread and the lemon as their food. They need that food to live and grow.

How does a tiny mold organism eat a lemon peel? Do the mold organisms have mouths and teeth? No! Instead, each mold organism gives off juices that have chemicals in them. These chemicals break down the lemon into smaller bits and pieces (molecules) that can move right into the mold organism's body. The mold organism uses this food to get the matter and energy it needs to live and grow.

But mold organisms don't just use lemon peels and bread as food! They use dead plants and animals too. They also use materials that were once part of a living thing—like fallen leaves, branches, and fruit. They can even use things made out of once-living plant materials, like paper, rice, cloth, and wood! In the next picture, mold organisms are using a wooden piano as food. This piano was damaged by flood waters in a hurricane.



Courtesy of Jeramey Jannene/
Wikimedia Commons

So mold can eat and grow on anything that was once alive or was made from once-living plant materials.



STOP AND THINK

Is mold a living thing? How do you know?

Are mold organisms producers or consumers? Why do you think that?

How Does Mold Cause Rotting?

Rotting happens when mold eats dead organisms or materials that were once part of a living thing. First, the mold uses its chemical juices to break down food matter into different kinds of tiny bits. The mold uses some of these tiny bits as food so it can live and grow. Other tiny bits of matter are left behind in the environment. For example, minerals and water molecules are left behind in the soil. Carbon-dioxide molecules are released into the air as an invisible gas.

Scientists use a special word to describe rotting: **decomposition**.

Decomposition is a process that breaks down dead organisms or once-living plant materials into tiny pieces of matter. Organisms (like mold) that do the work of breaking down this once-living matter are called **decomposers**.

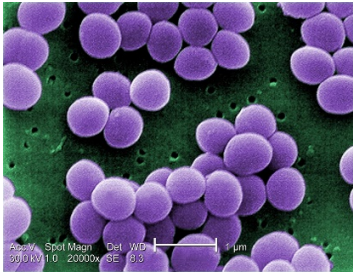


STOP AND THINK

What do molds leave behind as they eat dead organisms?

Are Mold Organisms the Only Decomposers?

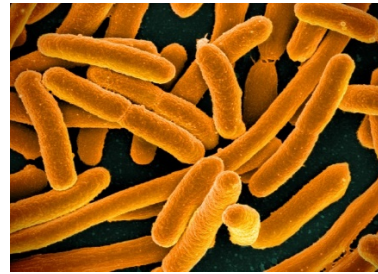
Mold organisms aren't the only decomposers. Tinier organisms called **bacteria** do a lot of decomposing too. Bacteria are so tiny that they can only be seen with a microscope. A very powerful microscope took the following pictures of three kinds of bacteria. Describe the different shapes of these bacteria.



Courtesy of Janice Haney Carr,
Wikimedia Commons



Courtesy of CDC/Dr. David Cox



Courtesy of NIAID

Although we can't see them, bacteria are everywhere! They're in the air. They live in the soil. They're in our lakes and rivers.

Bacteria are even inside us and all over our skin!

Like mold organisms, bacteria are tiny living things that need food to survive and grow. But they can't make their own food like plants, and they can't hunt for food like animals. Like all decomposers, they use dead plants or animals and other once-living materials as their food. They even eat wastes that animals leave behind. They find these food sources in their environment. If they live in the soil in the forest, they eat lots of leaves and dead branches that fall to the ground. If they live in a pond, they eat dead fish and dead water plants. If they live in a cow pasture, they might eat dead grass or even cow poop!

Like mold, bacteria break down dead organisms or once-living materials into tiny pieces of matter that they can eat to live and grow. They also leave behind other tiny pieces of matter in the environment. They leave behind minerals and water in the soil, and they release carbon-dioxide molecules into the air.



STOP AND THINK

How are bacteria and mold similar?

Why Is Rotting a Good Thing?

Decomposers are the great **recyclers** of matter. They help make sure that materials in the environment get used over and over again.

We've seen that molds and bacteria break down dead organisms and once-living materials into tiny pieces of matter they can eat. We've also seen that decomposers release minerals, water, and carbon dioxide into the environment around them. This is a good thing because plants can use carbon dioxide and water to make more food with the help of the Sun. Plants need this food to live and grow and make more food that animals need to live and grow. Plants also use the minerals that decomposers leave behind. Minerals aren't energy-supplying food for plants. Instead, minerals are like vitamins that help the plants be strong and healthy.

So the matter that decomposers leave behind is recycled in the environment. Plants use this recycled matter to make more food for themselves and for plant-eating animals called **herbivores**. Herbivores use this food to live and grow and have more offspring. This provides more food for meat-eating animals called **carnivores**.

When these plants and animals eventually die, decomposers like mold and bacteria will break them down into tiny bits and eat them. The decomposers will also leave behind minerals, water, and carbon dioxide that plants can use to make more food. So the cycle starts all over again!

Matter is never lost, and it never disappears. Instead, matter is used over and over again in the environment. This is why we say that decomposers are nature's recyclers.

Decomposers take things apart.
Producers put things back together again.



STOP AND THINK

Decomposers leave behind minerals, water, and carbon dioxide.
How do plants use these materials?

What Would Happen If Things Didn't Rot?

If dead materials weren't broken down into water, carbon dioxide, and minerals, what would happen?

- Plants would run out of the carbon dioxide and water they need to make more food. They would also run out of the minerals they need to be strong and healthy. Without these things, the plants would start dying.
- Herbivores (plant-eating animals) would die because there wouldn't be enough healthy plants for them to eat.
- Carnivores (meat-eating animals) would also run out of food and die.
- Without any decomposers to eat them, all of these dead organisms and their wastes would just keep piling up on the ground. Eventually there wouldn't be enough room for plants and animals (and us!) to live.

So even though rotting sometimes ruins our food and smells bad, it's also a very **good** thing. It recycles the matter plants need to keep growing, staying healthy, and producing the food that every living thing on Earth needs—including us!



STOP AND THINK

Describe what a world without rotting (decomposing) would be like.