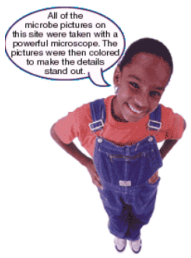
http://www.amnh.org/nationalcenter/infection/01_mic/01_mic.html

They're super small!
Some can multiply and mutate in minutes!
And they're EVERYWHERE!

Meet the Microbes

Microbes are the oldest form of life on Earth. Some types have existed for billions of years. These single-cell organisms are invisible to the eye, but they can be seen with microscopes. Microbes live in the water you drink, the food you eat, and the air you breathe. Right now, billions of microbes are swimming in your belly and crawling on your skin! Don't worry, over 95% of microbes are harmless. Three major types of microbes are BACTERIA, VIRUSES, and PROTOZOA.



Sep 1-4:27 PM

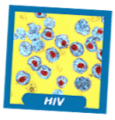
BACTERIA

Still counting: 4,000 species have been identified, but there are probably millions more.

Spirals, squiggles and more: Bacteria come in lots of shapes, including balls, rods, commas, spirals, and cubes.

On the go: Some swim forward by beating a tail called a flagellum; others slide on the slimy secretions they ooze.

VIRUSES



Masters of mutation: Viruses have the power to change quickly to survive in different environments.

Micro-pirate alert: Unlike bacteria and protozoa, viruses can't live on their own. They invade plant and animal cells for survival and to create more viruses.

Achoo!: The most common type of virus is the cold virus. There are 130 different kinds.

One time only: Normally, once your body has fought off a particular virus, you can't get sick from that virus again.

Sep 1-4:28 PM

PROTOZOA

What are they?!?: Protozoa are alive, but they are not part of the plant or animal kingdoms. Scientists gave protozoa a kingdom of their own.

Mostly harmless: About 40,000 species of protozoa are known -- only a few cause disease in people.

Big in a little world: Protozoa are the largest microbe, and they can be seen under a simple microscope.

Super swimmers: Most protozoa live in moist habitats, from droplets of water in the soil to the ocean.

Sep 1-4:29 PM

Infection!

PLAY Infection! The game where YOU are the germ!

Hi, I'm Varuni Kulasekera. I'm a Medical Entomologist at the American Museum of Natural History in New York City, and I study how microbes get from one place to another. When harmful microbes, or germs, enter the body, they multiply and cause disease. This is called **infection**. Your body's defenses usually do a killer job of squelching harmful microbes. But sometimes germs multiply faster than the body can handle -- and you get sick. People come in contact with germs in many ways, including:

- **Contaminated blood**: Harmful microbes can enter your body through your bloodstream.
- **Infected food or water**: Dangerous microbes can enter through your mouth if you drink untreated water or swallow food that's uncooked or unwashed.
- **Disease-carrying creatures**: Harmful microbes can enter your body through close contact with infected creatures.
- **Germy air**: Dangerous microbes can spread through the air and enter your nose and mouth when you breathe.

Sep 1-4:30 PM

Your body's **FIRST LINE OF DEFENSE** against germs includes skin, mucous membranes in your nose and throat, tears, the tiny hairs in your nose, bleeding, peeing, and sweating. These protectors either block harmful microbes from entering your body, or wash them away.

If germs get beyond the **FIRST LINE OF DEFENSE**, your blood has a **SECOND LINE OF DEFENSE** known as the **immune system**. If germs enter the bloodstream, they will be attacked by cells called **macrophages** (also known as white blood cells). These cells will gobble and dissolve any foreign microbes. Our bodies also produce **antibodies** that go after specific diseases. For example, if you have already had chicken pox, then your body's chicken pox antibodies will make sure that you don't catch that disease again. If your doctor gives you a **vaccine** for a particular disease, it helps your body create antibodies for that disease. Then your body will be able to fight it in the future. To see how your body battles microbial invaders, play the "**Infection!**" game. You'll see how your body defends itself against infection.

Help Your Immune System Help You Stay Healthy

- get 7-8 hours of sleep every night
- eat a variety of healthy food
- drink lots of water every day
- play outside so you get fresh air and exercise

Sep 1-4:31 PM