



# Zoo on You!

## **Audience**

Activity is designed for 12 years old and up. See the Adaptation section, to make this activity work for a younger student.

## **Goal**

Students will use deductive reasoning and trial and error processes to identify different species of microorganisms.

## **Objectives**

- To examine different microbial species.
- To identify microorganisms based off given information and pictures.

## **Conservation Message**

All animals play vital roles in their ecosystems, even the icky ones. Slimy worms are important decomposers of organic matter. Creepy spiders are a valuable food source in the food web. It is important that we value all wildlife and find ways to educate ourselves to be better conservationists. Little changes in your life, can make a huge impact on the nature world. Try turning off the light when leaving a room, use a refillable water bottle instead of a disposable plastic one and shut off the water when you are brushing your teeth!

## **Background Information**

We live with things we can't always see; sometimes these things even live on us or in us! Organisms that spend their lives at a size too tiny to be seen with a naked eye are called microbes. Microbes include organisms like bacteria, protists (algae or mold), fungi, and archaeobacteria. Some of these microbes are nasty and can hurt us like tapeworms. Others, like the firmicutes that live in our gut, help with digestion. Some microbes that can be found on the human body are:

### Face Mite

These mites can be found in human hair follicles, normally on the face. Under normal conditions, they are not harmful, and classified as commensals (the mite benefits but there is no harm or benefit to the host).

### Head Lice

Head lice is a human parasite. Head lice are wingless insects spending their entire life on the human scalp and feeding exclusively on human blood. Head lice are spread by close contact with an infected person or transferred by clothing items. Head lice do not spread any known diseases.

### Body Lice

Body louse looks exactly like head louse but are a different species. They can be found in the seams of tight-fitting clothing. This body louse is known to spread disease.

### Firmicutes

Firmicutes are bacteria that live in your gut and aid in digestion. There are 10 times more firmicutes living in your body than there are human cells. Firmicutes are also beneficial to humans because they crowd out other bacteria that could cause harm.

### *Streptococcus mutans* (Tooth Decay Bacteria)

*Streptococcus mutans* is a bacterium that lives in your mouth. It causes tooth decay that leads to cavities.

### Tapeworm

Tapeworms are parasitic flatworms. They typically live in the digestive tracts of vertebrate animals. People get tapeworms by eating undercooked meat or if they live in, or eat food prepared in unclean situations.

### Lung Fluke

Lung flukes are transmitted to humans by eating raw or undercooked seafood. They live in the lungs and cause inflammation and sores. Human infestations can last up to 20 years. They are most common in Asia and South America.

### Guinea Worm

Guinea worms come from drinking contaminated water. Initially there are no symptoms. About a year later, the person develops a painful burning feeling typically on the lower limbs. The worm then comes out of the skin over the next few weeks. They currently are only found in Africa.

### Athlete's Foot Fungus

Athlete's foot is a common skin infection of the feet caused by fungus. It causes itching, scaling, redness and in severe cases, blister. Athlete's foot fungus may infect any part of the foot, but most often grows between the toes.



### Staphylococcus hominis (Body Odor Bacteria)

*Staphylococcus hominis* is a harmless commensal bacterium that lives on human skin. It is known for producing body odor. Treatments for body odor include bathing regularly and using deodorant.

### Scabies

Scabies is a contagious skin infestation. Symptoms include severe itchiness and a pimple-like rash. After infection, symptoms appear within two to six weeks. Scabies mites burrow into the skin to live and deposit eggs. Scabies is spread by direct skin contact with an infected person.

### Tick

Ticks are small arachnids. Ticks are parasites that drink the blood of their hosts. Ticks are vectors for several diseases that affect both humans and other animals.

### Bot Fly Larva

The human bot fly is a fly in which the larvae form is a human parasite. The female fly captures a mosquito and attaches eggs to the mosquito's body. The fly then releases the mosquito. The eggs hatch when the mosquito is feeding, and the larvae use the mosquito bite as an entry point. The larvae develop inside the skin for about eight weeks and then drop out to pupate in the soil. Human bot fly is found from Southern Mexico south through northern Argentina, Chile, and Uruguay.

### Giant Kidney Roundworm

Giant kidney Roundworm is a parasitic roundworm. The mature form is found in the kidneys of mammals, including humans. They can be found worldwide but are less common in Africa and Oceania. Human infestation is rare and is caused by eating contaminated seafood.

### **Materials Needed**

- Where Do These Microbes Belong? Worksheet (provided)
- What Microbe Am I? Worksheet (provided)
- Pen or Pencil

### **Materials Needed for Adaptation**

- Where Do These Microbes Belong? Worksheet (provided)
- What Microbe Am I? Worksheet (provided)
- Chalk
- Space on a Sidewalk

### **Length of Activity**

30 minutes



## Procedures

- After reading the background information take a look at the worksheets.
- For the Where do these microbes belong? Worksheet draw a line from the microbes to the area the microbe affects on the person.
- On the What microbe am I? worksheet read the riddle and try to guess what microbe it is.

## Adaptation - Make this activity fit a younger student!

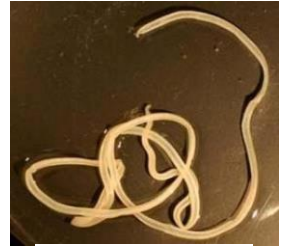
- Cut out the microbes from the Where Do These Microbes Belong? Worksheet and What Microbe Am I? Worksheet.
- Head outside with your microbes and some chalk.
- Have someone lay down on the sidewalk and trace their body.
- Place the microbes on the areas they affect on your body outline.
- Now you can see the Zoo on you!



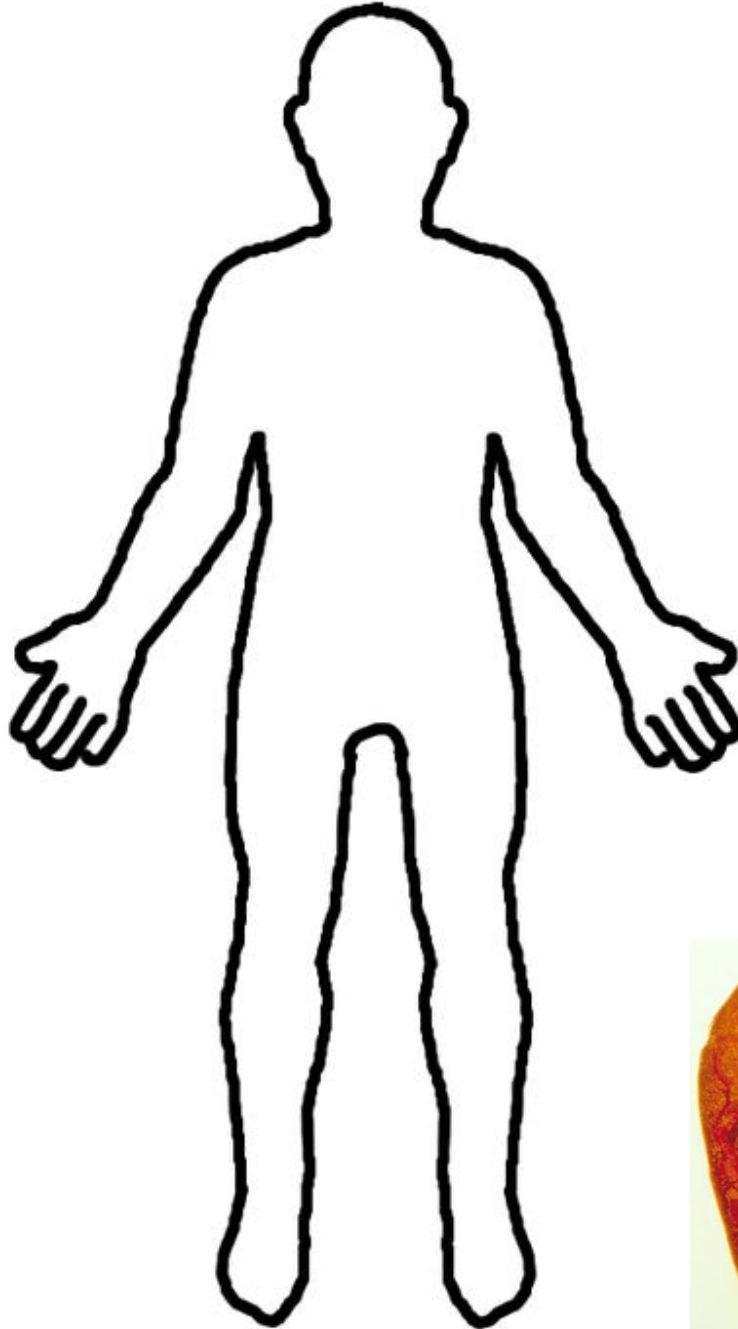
# Where do these microbes belong?



Giant Kidney Roundworm



Guinea Worm

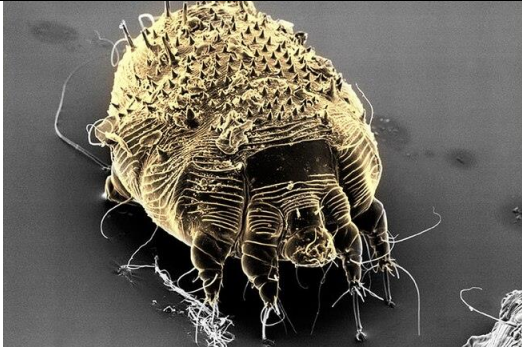


Microscopic view of  
*Streptococcus mutans*



Lung Fluke

# What Microbe Am I?



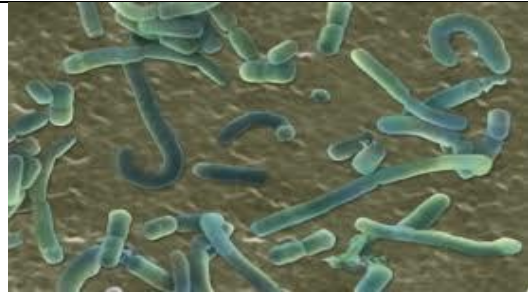
I am a type of mite that burrows into your skin and causes itchiness and pimple-like rash.  
What am I?



I am the larval stage of a parasite that uses a mosquito as a vector and grows inside your skin before dropping out.  
What am I?



I am a type of fungus that typically grows between the toes and causes itching, redness and blisters.  
What am I?



I am a beneficial bacteria that lives in your gut and helps you digest food.  
What am I?

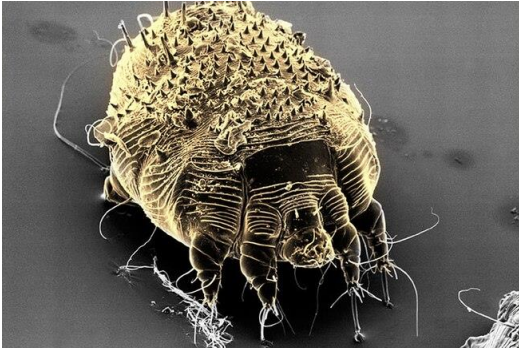


I live in your hair follicles and help out by eating dead skin and don't cause you any harm.  
What am I?



I am a parasite that spend my entire life living on the human scalp and drinking your blood.  
What am I?

# Microbes Answer Sheet



Scabies



Bot Fly Larva



Athletes foot fungus



Firmicutes



Face mite

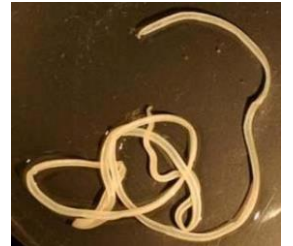


Head Louse

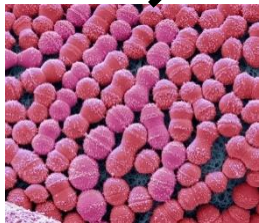
# Where do these microbes belong? Answer Sheet



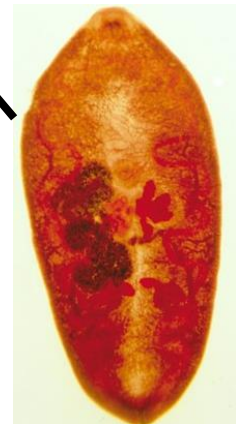
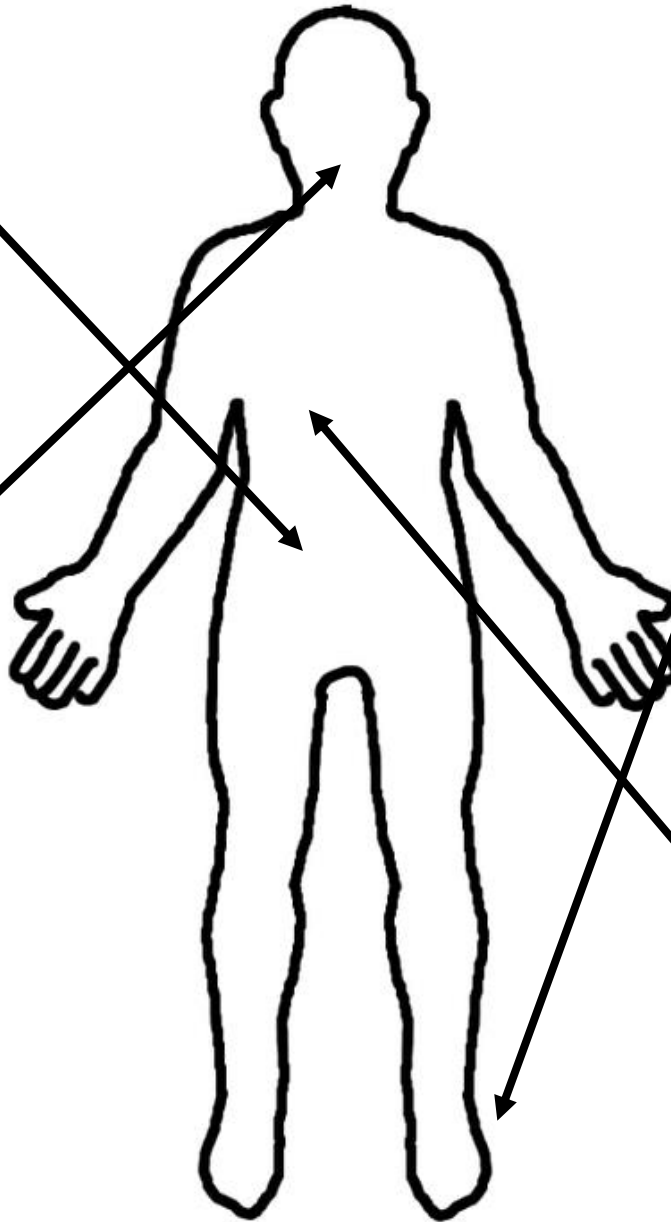
Giant Kidney Roundworm



Guinea Worm



Microscopic view of *Streptococcus mutans*



Lung Fluke