

# Bacteria, Viruses, and the Microbiome

**Length:** 15 minutes

**Materials:** Worksheet #1 printed for each student, computer and projector for PowerPoint slides and optional video.

**PowerPoint Slides:** If using the prepared slide deck, this section will go through slides 1-10

This section starts with an introduction to the microbiome. Ask students if they know what the microbiome is. The microbiome is all of the living organisms, such as bacteria, viruses, and fungi, that are found in and on our body.

Emphasize that bacteria can be helpful or harmful to humans. Helpful (or good) bacteria are called **commensals**. They can help in digestion of foods and can compete with bad bacteria and prevent infections. Harmful (or bad) bacteria are called **pathogens**.

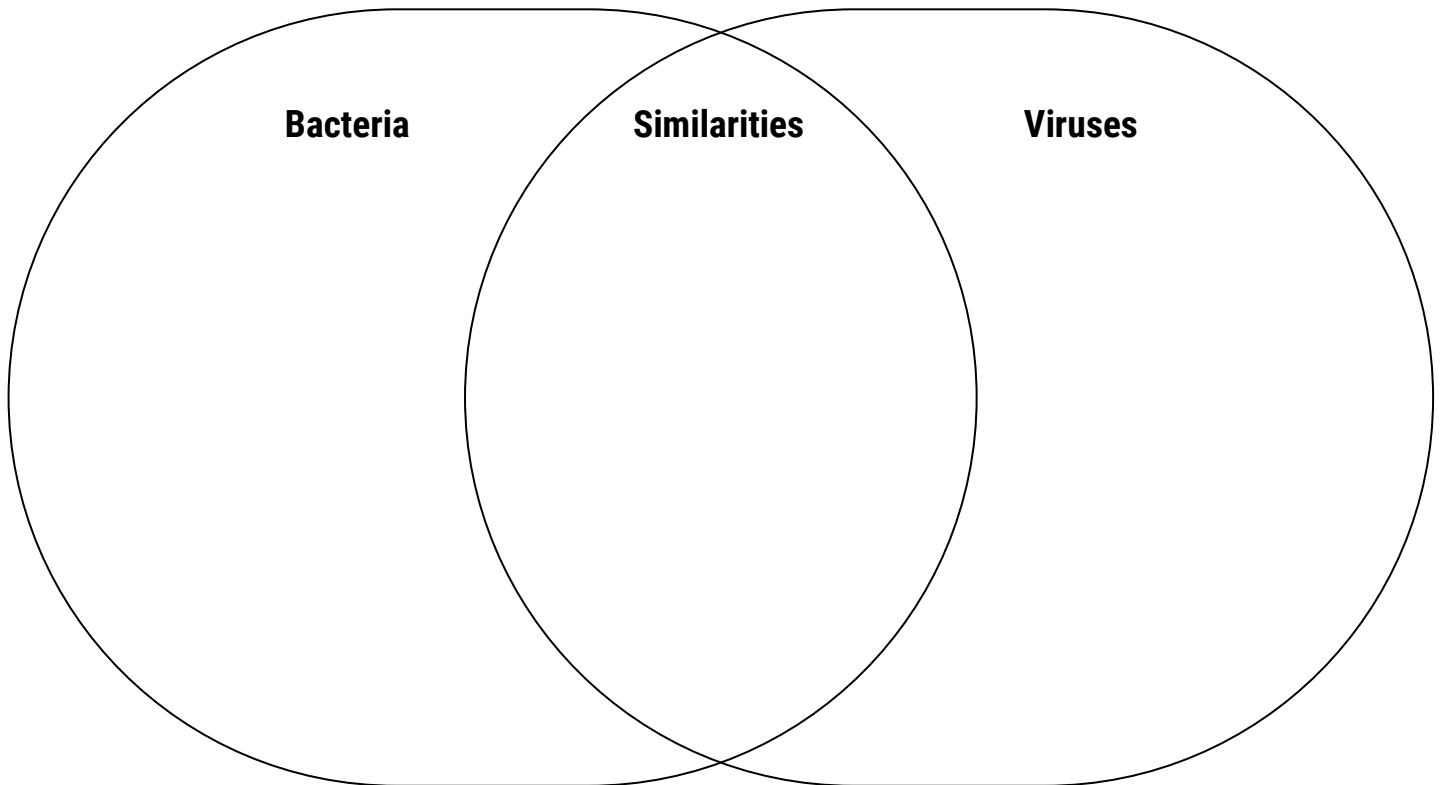
- Ask students to list similarities and differences between bacteria and viruses. (**Worksheet #1**). If they don't know any differences, provide examples from the answer key (**page 5**).
- Ask students if they can think of any illnesses caused by bacteria? Illnesses caused by viruses? (**Worksheet #1**). Students can guess or look it up on the internet if time permits. Write answers on the board.
- Ask students what antibiotics are? Ask if they or anyone in their family ever taken antibiotics? Review that antibiotics are a class of medications that are specifically designed to kill bacteria. They do not work against viruses.
- As an example, ask students if they have ever heard of an antibiotic, for example penicillin. Antibiotics like penicillin are designed to attack the cell wall of bacteria. Based on our discussion on the difference between viruses and bacteria, would penicillin work against viruses? (No, because viruses do not have cell walls).
- Return to the list of illnesses caused by bacteria vs. viruses. Antibiotics can only be used for the illnesses that are caused by bacteria. They should not be used for illnesses caused by viruses.

**Optional Video “Good Germs vs. Bad Germs” (2:54 mins)**



<https://www.youtube.com/watch?v=qDluMg9lqn8>

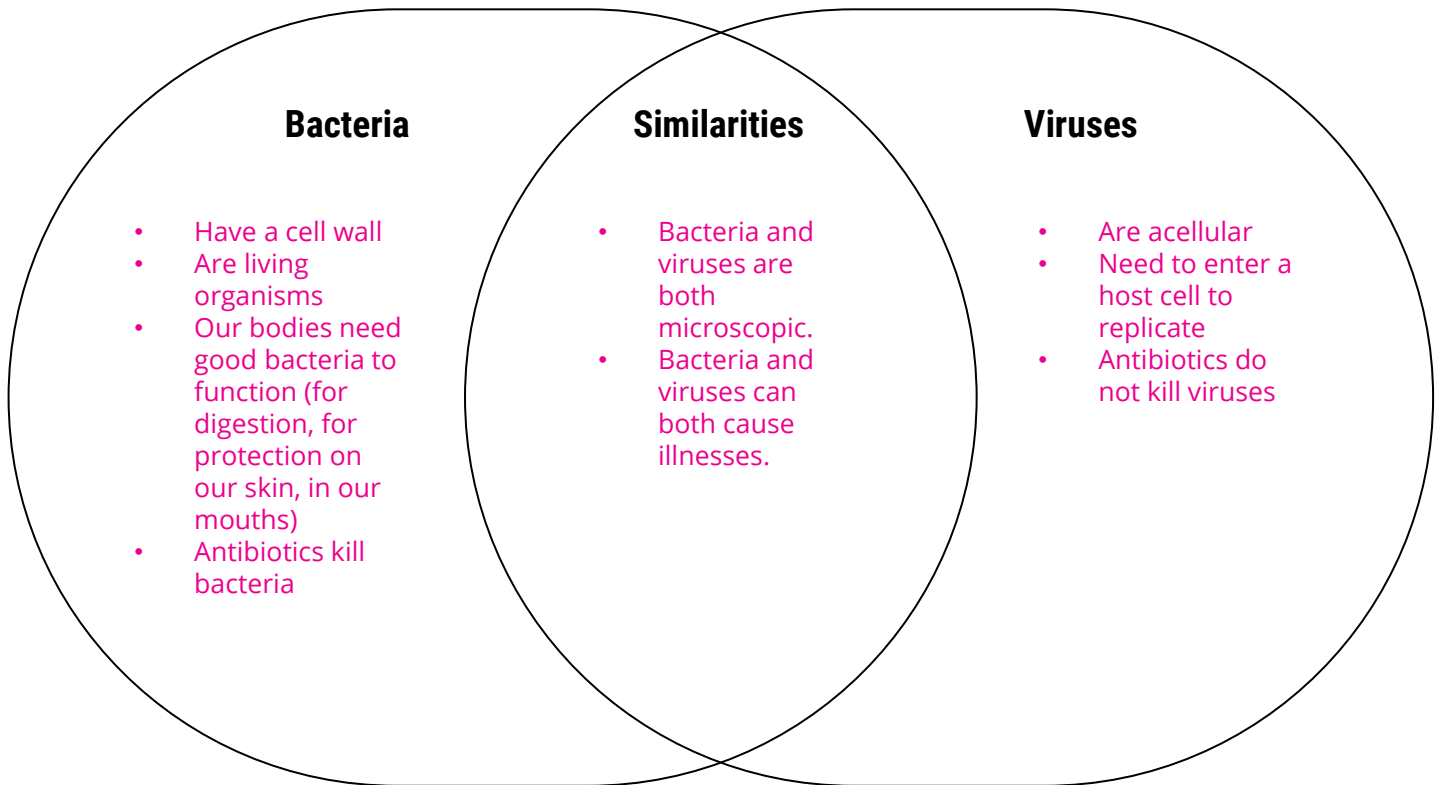
## Bacteria and Viruses



Illnesses caused by viruses	Illnesses caused by bacteria
<p><b>Word Bank</b></p> <ul style="list-style-type: none"> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Common cold</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• COVID-19</li> <li style="width: 33%; margin-bottom: 5px;">• Pertussis</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Strep throat</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Tuberculosis</li> <li style="width: 33%; margin-bottom: 5px;">• Meningitis</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Salmonella</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Urinary tract infections (UTIs)</li> <li style="width: 33%; margin-bottom: 5px;">• HPV</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Influenza (Flu)</li> <li style="width: 33%; margin-right: 3%; margin-bottom: 5px;">• Chicken pox</li> <li style="width: 33%; margin-bottom: 5px;">• Most sore throats</li> </ul>	

1. Antibiotics can work for illnesses caused by bacteria.
True
False
2. Antibiotics can work for illnesses caused by viruses.
True
False

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1. Antibiotics can work for illnesses caused by bacteria.

True

False

2. Antibiotics can work for illnesses caused by viruses.

True

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