

GERMS & STAYING HEALTHY

Grades 6-12



ESSENTIAL QUESTIONS

What are germs? How do they make us sick?
How can we prevent them from spreading?

ABOUT THIS LESSON

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LEARNING OBJECTIVES

By the end of this lesson, you will:

- learn what germs are and how some of them can make us sick.
- compare two common types of germs: viruses and bacteria.
- explore ways to prevent the spread of disease-causing germs, such as viruses and bacteria.



**LET'S GET
STARTED**



What are viruses?

Explain your findings.

Collaborate!

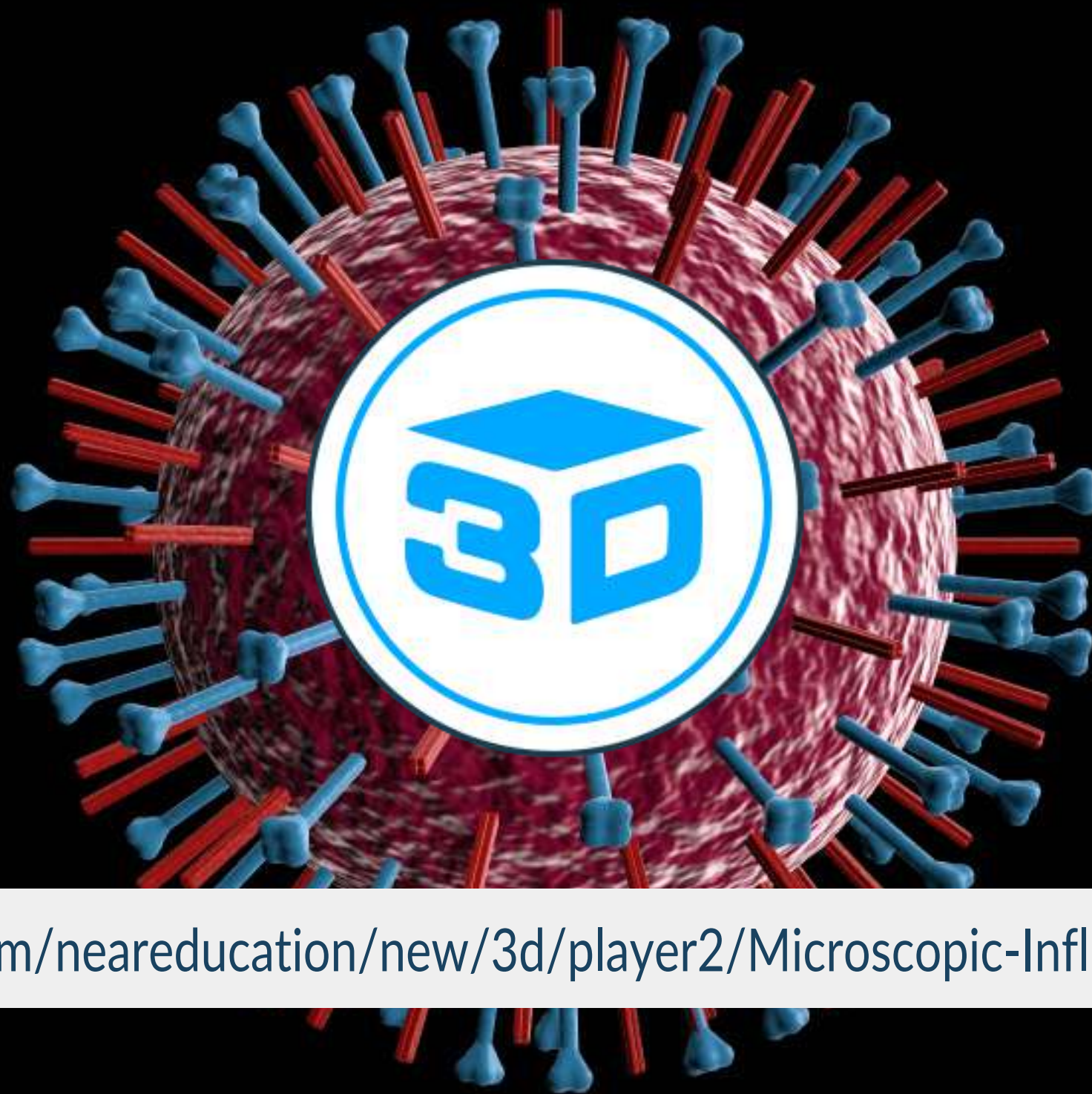
What are viruses?



A VIRUS IN 3D

On the next slide, you will look at a 3D model of a virus. As you observe, note whether this model matches what you expected a virus to look like.

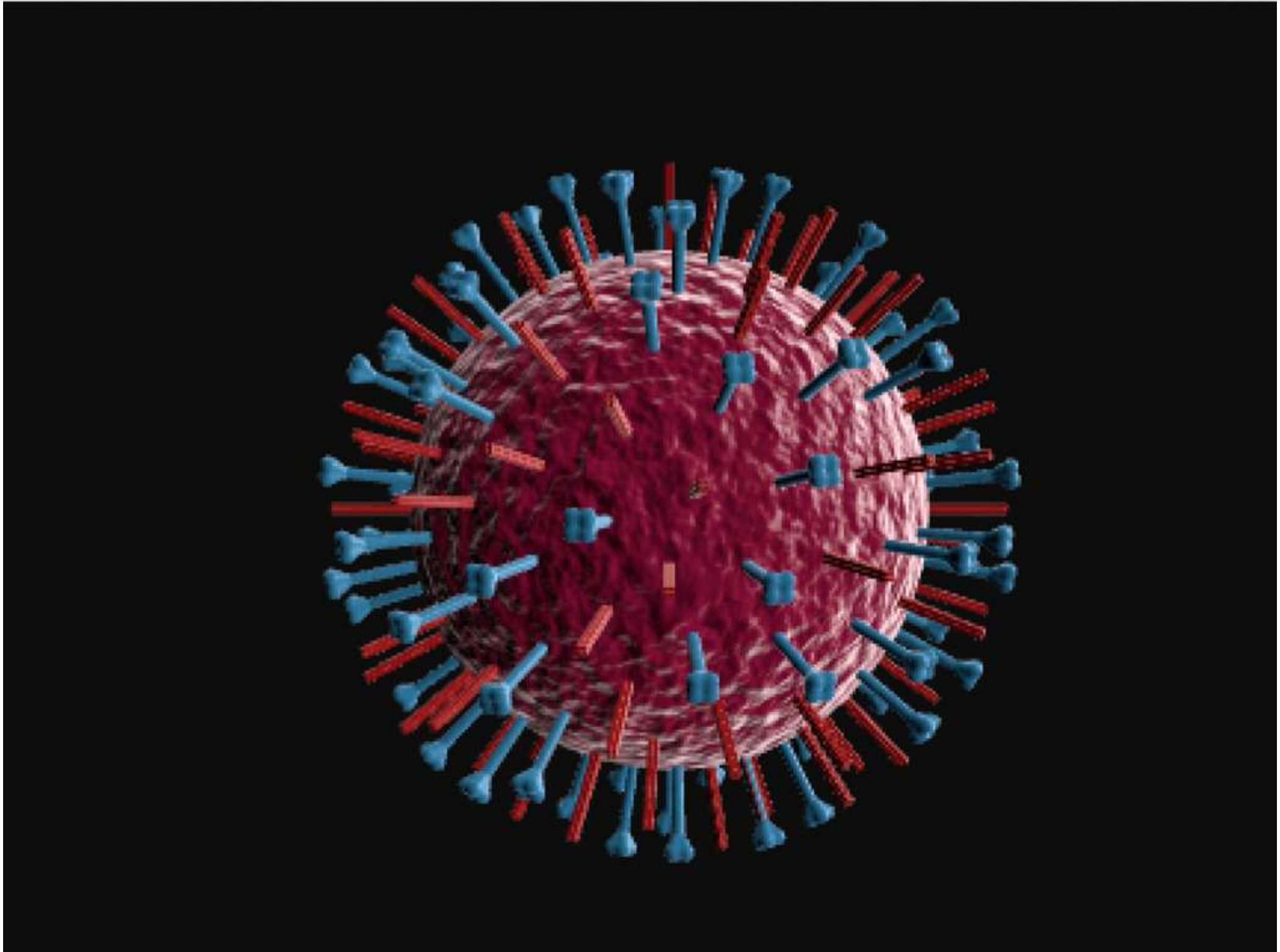
The surface proteins of the virus are often referred to as “keys” that match the “locks” found on the surfaces of other cells. These proteins are what allow viruses to enter cells. As you look at the following 3D model of a virus, see if you can identify these “key” proteins.



<https://cf.nearpod.com/neareducation/new/3d/player2/Microscopic-InfluenzaVirus/index.html>

Draw It

On the following image, label which parts of the virus you think are often referred to as "keys."





VIRUSES AND CELLS

Some viruses have spikes on their envelopes, made of glycoprotein, which allow them to attach to specific cell surfaces, sometimes referred to as “locks.” On the next slide, you will see an animation illustrating this process.



<https://www.youtube.com/embed/Rpj0emEGShQ>



LET'S LEARN

Open Ended Question

How would you define germs?



GERMS AND ILLNESS

On the next slide, you will watch a video about germs and how some of them can make us sick. As you watch, pay attention to the different types of germs mentioned in the video. Did you know that all of these fall under the “germ” category? In addition, note what all germs have in common.



<https://www.youtube.com/embed/yxonJTWhBJQ>

Quiz

Which of the following qualify as germs? Select all that apply.

- ☐ Bacteria
- ☐ Fungi
- ☐ Protozoa
- ☐ Viruses

What do all germs have in common?

- ☐ They are all equally harmful.
- ☐ They all quickly replicate within our bodies.
- ☐ They all have the ability to interact with our bodies and change how we feel and function.
- ☐ They all have the ability to be eliminated with drugs.

Open Ended Question



In your own words, explain why a virus such as the rhinovirus, which relies on close contact to spread, might evolve to favor less virulent forms.



According to the video, what are some ways we can prevent harmful germs from spreading?

Collaborate!



BACTERIA VERSUS VIRUSES

Now, we will learn more about two types of germs often talked about when people get sick: bacteria and viruses. As you watch, pay attention to the differences between bacteria and viruses.

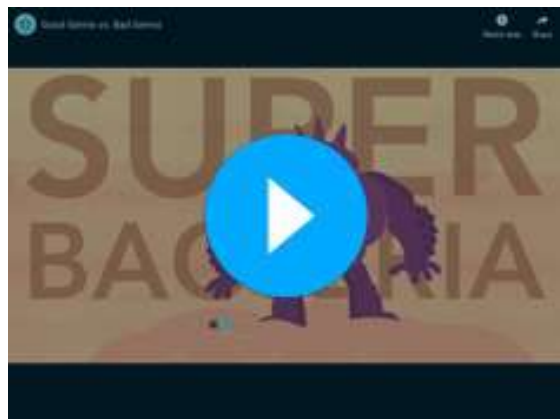
This video was made to raise awareness about the potential risks of using antibiotics for illnesses not caused by bacteria. Do you think this might be useful information for people seeking medical care? Why or why not?



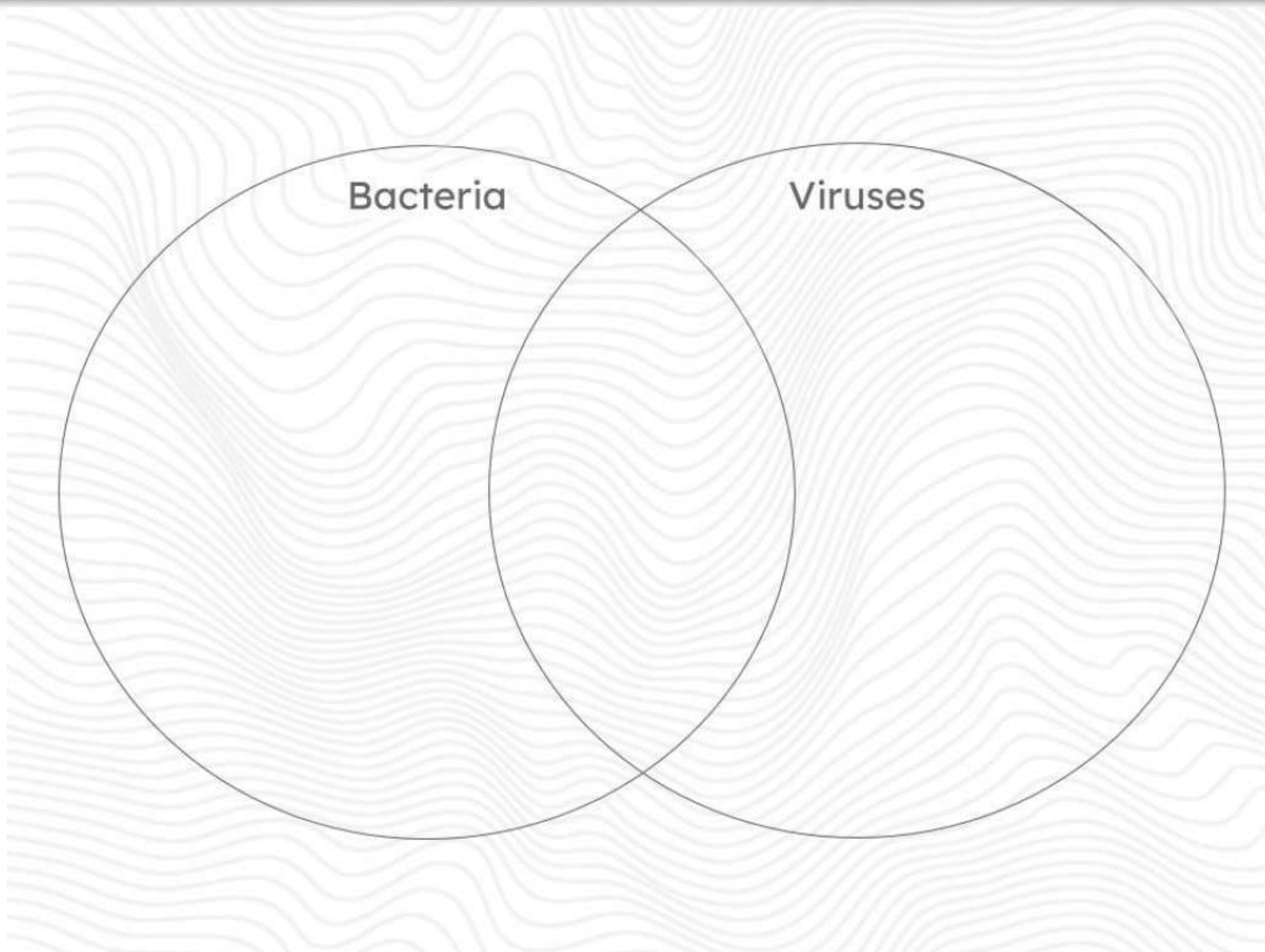
<https://www.youtube.com/embed/qDluMg9lqn8>



Draw It



What did you learn about bacteria? What did you learn about viruses? Compare and contrast them using the Venn diagram below.





HOW VIRUSES SPREAD

Now that you have learned some differences between bacteria and viruses, you will watch a video about how viruses spread. As you watch, pay special attention to what happens during the lytic cycle.



https://www.youtube.com/embed/TimzNM_Jxq0

Open Ended Question



Explain something you learned about the way viruses spread.



**LET'S TALK
ABOUT WHAT
WE CAN DO**

Slideshow



STAYING HEALTHY

Health experts recommend many habits to stay healthy and prevent the spread of illness, from a healthy diet to regular immunizations. During cold and flu season especially, experts remind us not to cough or sneeze into our hands, to keep our fingers away from our faces, and to stay home if we are sick.



HAND WASHING

The piece of advice we most often hear, however, is to wash our hands properly and regularly. Many believe this is the single most important thing humans can do to prevent the spread of disease-causing germs. On the next slide, you will brainstorm about what might be important to consider when washing your hands.



What is the most effective way to wash your hands if you want to prevent the spread of disease-causing germs?

Collaborate!



HAND WASHING TECHNIQUES

Now, you will look at an article featuring images of hands and revealing leftover germs after different hand washing techniques are applied. As you read the article and look at the images, decide what method is best for eliminating germs from hands.



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Photos show why hand sanitizer doesn't work as well as soap and water to remove germs

Mia de Graaf Mar 6, 2020, 8:14 PM



<https://www.businessinsider.com/coronavirus-photos-why-you-should-wash-hands-with-soap-water-2020-3>



Poll

Which of the following hand-washing methods do you think is most effective to prevent the spread of disease-causing germs?

- ☐ Washing with soap for thirty seconds.
- ☐ Rubbing hands for thirty seconds. with at least a teaspoon of 60% alcohol hand sanitizer.
- ☐ Washing with soap for fifteen seconds, then rubbing for another fifteen seconds with hand sanitizer.



THINK-PAIR-SHARE

One of the images you saw in the article went viral on social media. Why do you think people might want to share this type of image?



WHAT THE MAYO CLINIC SAYS

The Mayo Clinic is an organization that conducts medical research and education. On the next slide, you will watch a video by the Mayo Clinic explaining their recommendations for hand washing. As you watch, consider whether you might want to wash your hands more often and/or in a different way.



<https://www.youtube.com/embed/knAPHGpiM9k>

Poll

Did the video or today's lesson give you any ideas for how to prevent the spread of germs such as viruses and bacteria? Be prepared to discuss.

☐ Yes

☐ No



WHAT WE CAN DO

With the class, discuss what you think you might be able to do to keep yourself and those around you healthier.

THANK YOU!



CREDITS & SOURCES

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