

Empathy Element 9-B: Knowledge as a Tool

Biology, Pre-Med	Knowledge as a Tool
<p>Grade Level: High school</p> <p>Time: 45 minutes</p> <p>Resources: Video or text</p>	<p>Teachers or Self-Guided Learners</p> <ul style="list-style-type: none">• Watch two videos – one from a science teacher and one from a health care worker• Review the material in writing (or read it if you cannot access the videos)• Ask a study partner to quiz you on the information• Discuss how you could use this information as a community health advocate

Below, students asked questions about health care advocacy and disease prevention to a volunteer, Dr. Tsan Lee in 2018.



Introduction

Knowledge can serve as a powerful tool for practicing empathy. The more we understand, the more we can act on our desire to help.

The 2020 Covid-19 global pandemic offered an opportunity for people around the world to practice empathy through science.

- Researchers hurried their efforts to look for new vaccines and therapies.
- Health care workers worked long hours to care for patients, at risk to their own health.
- Essential workers in food, transformation and education tried to make sure others could eat and learn.
- Families and neighbors kept a safe distance and practiced sanitation, so as not to infect others, in case they were carrying the disease.

Learn from the science teacher and the health care worker on these videos about viruses, in general, and about the novel coronavirus, in particular.

Review the information below if you cannot access video.

Presentation by Science Teacher: What Is a Virus?

A virus is a biological particle composed of genetic materials and protein which are microscopic. A typical virus consists of either RNA or DNA enclosed in a protein coat called capsid. When a virus causes a disease, the virus is said to be virulent. DNA – Deoxyribonucleic acid —stores the information needed to build the protein; it also carries the message about an organism. RNA — Ribonucleic acid— is present in all living cells. Its function is

to act as a messenger carrying instructions from the DNA for controlling the synthesis of proteins.

General Characteristics of Virus

- Virus is not a living organism
- Virus consists of nucleic acid core and a protein coat called the capsid
- Virus cannot grow or replicate on their own
- Virus can only reproduce inside of a living host cell using its raw materials and enzymes

Structure of viruses

Viruses are the smallest organisms about 50 times smaller than bacteria. It lacks nucleus, cell membrane or cytoplasm and are acellular – akaryotic. They have genetic materials surrounded by a protein coat. Viruses vary in size and shape. Some are rod shape, round shape, and composed of an outer protein coat called capsid and inner core of genetic materials DNA or RNA.

Classification of Viruses

There are three classes of viruses, namely:

1. Bacterial virus which invades the cells of bacteria. Viruses that attack bacteria are called bacteriophage.
2. Animal virus which invades the animal cells. An animal virus may become inactive only in certain tissues, organs, and systems. Example, polio virus is human virus that attack only one kind of nerve cells in the brain and the spinal cord.

3. Plant Virus – viral diseases of flowering plants are very common. The virus can only invade a specific cell of a plant such as the leaves, the stems or the roots.

Life Cycle of a Virus

The virus life cycle has five stages:

1. Attachment
2. Entry
3. Replication
4. Assembly, and
5. Release

Some viral diseases are:

1. Common cold
2. Mumps
3. Chicken pox
4. Polio
5. HIV/AIDS
6. Ebola
7. Novel Coronavirus

Presentation by Health Worker: What is COVID-19?

COVID-19 is a disease caused by a new strain of coronavirus. 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus.' The COVID-19 virus is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome and some types of common cold.

What Are The Symptoms Of COVID-19?

Symptoms can include fever, cough, and shortness of breath. In more severe cases, infection can cause pneumonia or breathing difficulties. More rarely, the disease can be fatal. These symptoms are similar to the flu or the common cold, which are a lot more common than COVID-19. This is why testing is required to confirm if someone has COVID-19.

How Does COVID-19 Spread?

The virus is transmitted through direct contact with respiratory droplets of an infected person. Individuals can also be infected from and touching surfaces contaminated with the virus and touching their face. The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it.

Who Is Most at Risk?

We are learning more about how COVID-19 affects people every day. Older people with chronic medical conditions, such as diabetes and heart disease, appear to be more at risk of developing severe symptoms. As this is a new virus, scientists are still learning about how it affects children. It is possible for people of any age to be infected with the virus, but so far there are relatively few cases of COVID-19 reported among children.

What Is the Treatment For COVID-19?

There is no currently available vaccine for COVID-19. However, many of the symptoms can be treated and getting early care from a healthcare provider can make the disease less dangerous.

How can the spread of COVID-19 be slowed down or spread?

As with other respiratory infections like the flu or the common cold, public health measures are critical to slow the spread of illnesses. Public health measures are everyday preventive actions that include:

- Staying home when sick;
- Covering mouth and nose with flexed elbow or tissue when coughing or sneezing. Dispose of used tissue immediately;
- Washing hands often with soap and water; and
- Cleaning frequently touched surfaces and objects.

As we learn more about COVID-19 public health officials may recommend additional actions.

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