



High School Science Virtual Learning

**Applied Biological Science**

**Introduction to Vaccines**

April 24, 2020



# High School Applied Biological Science

## Lesson: April 24, 2020

### **Objective/Learning Target:**

Students will understand vaccines, how they work, and how a human body reacts to them.



## Let's Get Started:

Watch this quick [introduction video](#). Answer the opening questions.

1. How do immune systems “fight” off infections?
2. What vaccines have you been given in your lifetime?



## Let's Get Started: **Answers**

1. White blood cells are able to destroy or disable various harmful materials and organisms that end up inside your body.
2. A substance that mimics harmful organisms to “train” or “prepare” your body to fight an infection by stimulating the production of antibodies.



# Lesson Activity:

**Directions:** Today, you will learn about how vaccines work. If you do not remember much about how viruses infect, watch this quick recap [video](#) on viruses. Follow the link [here](#) and answer the questions on the following slide. You may need to click additional links on the page to find all of the answers.



# Practice

You will use the information from the activity on slide 5 to answer the following questions.



# Practice Questions

1. Define: Vaccine, Vaccination, Immunization
2. Read the linked section, "[Are Vaccines Safe?](#)" Write a couple of sentences describing the process used to test the safety of vaccines.
3. Read the linked section, "[How do Vaccines Work?](#)" Write a couple of sentences describing how vaccines protect you and your community.
4. Read the linked section, "[What are the Different Types of Vaccines?](#)" Write a sentence describing how each type of vaccine operates.
5. Read the linked section, "[What's in Vaccines?](#)" Write a couple of sentences describing the ingredients that provide immunity and the ingredients that keep vaccines safe to use.



# Practice Questions **Answer Key**

1. Define: Vaccine, Vaccination, Immunization
  - a. **Vaccine: small amount or piece of a germ that prepares your body to fight the infection.**
  - b. **Vaccination: the act of getting a vaccine, usually in the form of a shot.**
  - c. **Immunization: the process of becoming protected against getting a disease**
2. Read the linked section, "[Are Vaccines Safe?](#)" Write a couple of sentences describing the process used to test the safety of vaccines. **Vaccines are tested using studies and clinical trials. Every batch of vaccines is tested to make sure it is potent, pure, and sterile. Vaccines are monitored once they are given to the public.**
3. Read the linked section, "[How do Vaccines Work?](#)" Write a couple of sentences describing how vaccines protect you and your community. **Vaccines help your immune system fight infections faster and easier. Vaccines start an immune response, helping your body fight off and remember the germ so it can attack it if the germ ever invades again. When enough people are vaccinated in a community, those that are not will probably still not get sick, because the virus or bacteria cannot spread.**





## Practice Questions **Answer Key**

4. Read the linked section, “[What are the Different Types of Vaccines?](#)” Write a sentence describing how each type of vaccine operates.

- a. Live vaccines use a weakened form of the germ that causes a disease.
- b. Inactivated vaccines use the killed version of the germ that causes a disease.
- c. Subunit, recombinant, polysaccharide, and conjugate vaccines use specific pieces of the germ.
- d. Toxoid vaccines use a toxin made by the germ that causes a disease.

5. Read the linked section, “[What’s in Vaccines?](#)” Write a couple of sentences describing the ingredients that provide immunity and the ingredients that keep vaccines safe to use. **Antigens are very small amounts of weak or dead microorganisms that can cause diseases. Adjuvants are substances that help your immune system respond more strongly to a vaccine. Preservatives protect the vaccine from bacteria or fungus. Stabilizers keep the vaccine ingredients safe and functioning through storage and movement of the vaccine.**



# More Practice

Follow through the CDC's interactive to learn much more details about how the immune system is trained by vaccines.



# More Practice

## [CDC Interactive](#)

After reading the information, test your knowledge by clicking through the activity provided on the website.



## Additional Information

Watch [this video](#) to learn about how a vaccine for cattle helped aid the water buffalo and wildebeest populations in Africa.

Read this [article](#) and watch this [video](#) from the WHO to learn about HPV and cervical cancer.