

# Study Guide on HPV for School Nurses

## Overview

The aim with this study guide is to provide a material that makes it easier for the school nurses to explain for the children that are being offered vaccination what it means to get vaccinated against HPV.

The goal of the lesson to be managed by the school nurses is to educate 5th-grade students by exploring the science behind the human immune system and how vaccines help prevent diseases, such as those caused by the human papillomavirus (HPV). In grade 5 all children in Sweden are offered to get vaccinated against HPV and it is therefore important they have access to information.

Through a digital activity the class will be transported into a virtual human body created in Minecraft: Education Edition, a videogame-based learning platform. This part of the education has been developed independently by Microsoft.

The education aims to expand the student's knowledge and understanding of vaccines and the human body. There are also suggestions of topics to discuss with the students, as well as educational information on HPV-vaccine, viruses, as well as why the needle might hurt.

This life science-focused experience integrates STEM (Science, Technology, Engineering, and Medicine) principles such as problem solving, finding, and using evidence, and communication. Through interactive and engaging ways this education seeks to strengthen the knowledge and understanding the students have for vaccines and viruses.



## Setup

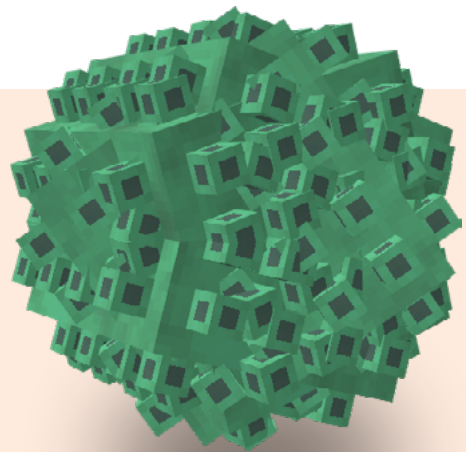
When you are guiding a class, make sure everyone has access to a computer or tablet with the **Minecraft: Education Edition** software installed, license to use it, as well as the **Virus and Vaccines** module.

For instructions to install this software, see the **Technology** section of this guide. Before you begin, please review the content in the **Background** and **Common questions** sections. These can help you answer questions and guide the discussions in the lesson.

## Learning objectives

**By the end of this lecture, a student should be able to:**

- Understand what human papillomavirus (HPV) is and why it can be harmful to the body, and that it can cause certain diseases such as cancer – both for boys and girls
- Describe how vaccines help the immune system stop certain infections



## Lesson plan

### Beginning discussion (15 minutes)

**Before entering the Minecraft: Education Edition, discuss the following:**

- What do you know about vaccines?
- Have you ever had a vaccine (or other shot) before?
  - What was it like? (Where did you go for the shot, who gave it?)
  - How did the shot feel?
    - Did the shot hurt?
    - Was the area around the shot sore afterward?
    - For how long?
- How do you think vaccines work in the body?
- Getting a vaccine helps protect you from a virus or bacteria. How do you think getting a vaccine can also help protect other people around you?
- What have you heard about HPV vaccine? Why do both boys and girls get vaccinated against HPV?

### Explore the Minecraft world (20–30 minutes)

- 1 During the lecture, start the world Virus and Vaccines in Minecraft: Education Edition.
- 2 Enter the world and speak to the scientist, then start to explore. If you as staff also have access to a computer or a tablet, explore the world as well. It is an interactive learning experience.
- 3 Let the students explore as much of the world as they have time for.
- 4 In the world Virus and Vaccines in Minecraft; Education Edition the students are educated on the way vaccines train the body's immune system to detect and destroy a specific virus or bacteria.

## Follow-up discussion (15–30 minutes)

**After everyone has completed the activities in the world, or you have decided to stop the exploring, discuss the following:**

- 1 What did you discover from exploring this world in Minecraft?
- 2 Have these activities changed how you think vaccines work?
- 3 Do you have any questions or concerns you would like to talk to your school nurse about?

## Background

**This section of the study guide provides background information towards how vaccines work and specifically vaccines against HPV.**

### How does vaccines work?

Vaccines train the body's immune system to detect and destroy a specific virus or bacteria. The immune system is the system of cells and tissues that protect your body from illness and infection. When a vaccine enters the body, it begins a complex process that involves many different cells.

### HPV vaccine in the body

The HPV vaccine contains HPV antigens, which are small pieces of the virus, such as proteins. When the vaccine enters the blood stream, cells called antigen-presenting cells collect and “present” the HPV antigens to helper T cells. These T cells “help” other cells in the immune system.

Helper T cells receive the HPV antigens in lymph nodes, which are tiny, bean-shaped organs that are part of the immune system. The helper T cells then signal other immune cells, called B cells, which can assemble antibodies.

Antibodies are proteins that “match” a specific antigen, like keys that match a specific lock. In this example, the B cell assembles antibodies that match the HPV antigens.

These HPV antibodies stay in the body and wait. If HPV ever enters the body, the antibodies will link to the HPV antigens they match. This signals the immune system to destroy the virus before it can cause serious harm.

Without the vaccine, the immune system wouldn't know HPV was a threat until it would be too late. The virus would infect other cells in the body and multiply quickly. Once this happens, the HPV vaccine can no longer work to prevent an infection from that type of HPV.

## Common questions

This section provides answers to common questions about the HPV vaccine. These can help guide group discussions and address common misinformation about the vaccine.

### **Who can get the HPV vaccine?**

The human papillomavirus (HPV) vaccine is for boys and girls starting at age 9, as well as for adults. In Sweden, boys and girls are offered HPV vaccine in grade 5. It is included in the Swedish childhood vaccination program.

### **What is human papillomavirus (HPV)?**

HPV is the name for a group of many viruses that can pass from person to person, usually through skin contact during sex. HPV infections can lead to health problems, such as genital warts and certain cancers.

### **Can a person know if they have gotten an HPV infection?**

HPV infections often don't have any symptoms at first, so a person may not know if they have HPV or when they got it.

### **Why do people get the HPV vaccine before they're sexually active?**

For the vaccine to have the best effect, a person should get it before an HPV infection has been passed to them, such as through sex.

If someone chooses to get the HPV vaccine later in their life, they may already have an infection from one of the types of HPV the vaccine protects against. But the person may not know they have an infection. When this happens, the HPV vaccine cannot protect the person from that type of HPV. The vaccine can still protect against the other types of HPV that haven't been passed to that person yet.

The earlier a vaccine is given, the better; waiting to take the vaccine is associated with an increased risk of HPV infection.

### **What does the HPV vaccine protect against?**

The vaccine is designed to protect against the types of HPV that lead to most cases of HPV-related cancers as well as genital warts. These include cervical cancers in women, as well as anal cancer for both men and women.

The vaccine itself cannot cause HPV-related diseases.

### **Why does it hurt when you get the HPV vaccine?**

When the HPV antigens in the vaccine enter the body, the immune system responds through a complex process that trains the body to destroy the virus in the future (see Background section). Part of the body's response is to release certain proteins that can lead to swelling and pain around the area you got the vaccine, such as the upper arm or thigh. Although it can be

unpleasant, this is a sign the vaccine is training the immune system. As the body processes the HPV antigens, the pain and swelling will go away – usually in a couple of days.

Many vaccines are given with a needle and syringe (a shot). The syringe holds the vaccine liquid, and the needle has a tiny hole in it for the liquid to flow through. The doctor or nurse inserts the needle into the skin, usually in the arm or thigh. This can hurt, and may seem scary, but the pain goes away quickly.

## Technology

### **What is Minecraft: Education Edition?**

Minecraft: Education Edition functions like regular Minecraft but is adapted to be used in school as a creative educational tool for learning. In Minecraft: Education Edition you also have access to educators such as tutorials, classroom management tools, sample lessons, and a network of mentors and tech support.

### **License for Minecraft: Education Edition**

You need an Office 365 Education account to access the complete version of Minecraft: Education Edition.

Minecraft is included in the license forms: Microsoft 365 A3 and A5 and is an add-on service in Office 365 A3 and A5.

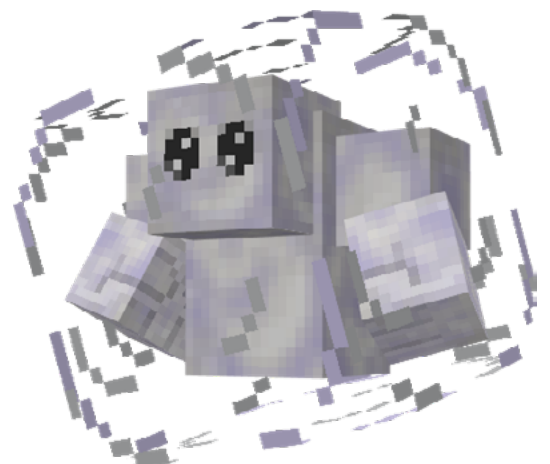
If your organization does not have Minecraft license you can use Minecraft: Education Edition for a limited number of times with access through your Office 365-account.

To determine if you have a Minecraft: Education Edition account visit: [education.minecraft.net/get-started](https://education.minecraft.net/get-started)

### **Installation**

Installing is not very different across different platforms. The primary difference between the Windows, macOS, Chromebook, and iOS versions is how the software is downloaded, installed, or deployed:

- First and foremost – contact your IT-department to see if they can push out Minecraft: Education Edition through your central management system
- If you are unable to do so, please visit: [education.minecraft.net/get-started/download](https://education.minecraft.net/get-started/download)



The module **Virus and Vaccines in Minecraft: Education Edition** has been developed independently by Microsoft. MSD has not been involved in the development of the Minecraft world.

Should you have any questions around Minecraft: Education Edition in general or specifically around the module Virus and Vaccines please contact:

Jerker Porat | [jerkerporat@microsoft.com](mailto:jerkerporat@microsoft.com)

## ! Additional information to the school nurses – a few tips!

### The following sources can be shared to guardians

- Together against HPV – a website from MSD with general information [hpvvaccin.se/](https://hpvvaccin.se/)
- Informative film on HPV vaccination from the Public Health Authority (Folkhälsomyndigheten) [youtu.be/jpkGcop4ivk](https://youtu.be/jpkGcop4ivk)

### If the school nurses need more information:

- There is information on HPV and vaccines on the Public Health Authority website
- Consent Documents for HPV vaccination is accessible through Sveriges Kommuner och Regioner (SKR)

### References

- Skolverket. Curriculum for the compulsory school, preschool class and school-age educare
- Folkhälsomyndigheten (Public Health Authority). Vaccines against human papillomavirus (HPV)
- Center for Disease Control and Prevention (CDC). Understanding How Vaccines Work

If you have a question regarding a MSD product, please contact:

[medicinskinfo@merck.com](mailto:medicinskinfo@merck.com)

This material is for healthcare professionals only.

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