So we are inside of a body. It could be your body, or that of a walrus, or a monkey. All animals are affected by viruses. The virus is on the left and the cell is on the right. Both the virus and the cell are covered in receptors.

Now the spike receptor of the virus can use the cell receptor to identify the type of cell, because different types cells have different receptors. Corona virus targets the cells of the lungs, while HIV is another virus that targets white blood cells.

What happens when a virus first binds to a cell is all initiated by the spike receptor. The spike receptor binds the cell receptor, and causes the virus to get pulled in close.

We are going to switch to an inside view of the virus and cell now, and see that the virus fuses with the cell and releases its contents inside. What we haven’t talked about yet is what happens next, which is that the viral RNA moves inside of the cell and goes into the nucleus.

The nucleus is where the cell copies all its genetic information.

The virus hijacks the equipment the cell normally uses to copy its DNA, and instead produces viral RNA. RNA and DNA are just related forms of genetic code, and we’ll learn about all this in quarter 4 this year.

So once the RNA from the virus has been in the nucleus a while, its leaks out into the cytoplasm, which is what we call the part of the cell which is not the nucleus. The RNA again recruits cell parts, this time to build the rest of the virus around the RNA.

So now we have all these copies of virus with their shells and spike receptors around them, and they’re just filling up the cytoplasm. What happens next is important in deciding what symptoms a virus is going to have. In coronavirus, we would be dealing with lung cells. So the respiratory symptoms that we see with coronavirus are actually related to the destruction of cells in the lung.

HIV infects white blood cells and destroys them, which causes patients to have immune deficiencies. HPV is another virus that causes warts, and what we see there is that the virus doesn’t actually destroy the cells, it causes them to replicate. To make copies of themselves. And that’s why we get a little build up of skin cells we call warts.

So one last thing to think about: If all the other possible lifeforms on earth: the plants, the monkeys, the humans, and the bacteria, all disappeared and only viruses remained, what would happen to the viruses? The virus would break down very quickly without hosts to protect them, and without the ability to replicate, the viruses would be permanently gone as well.