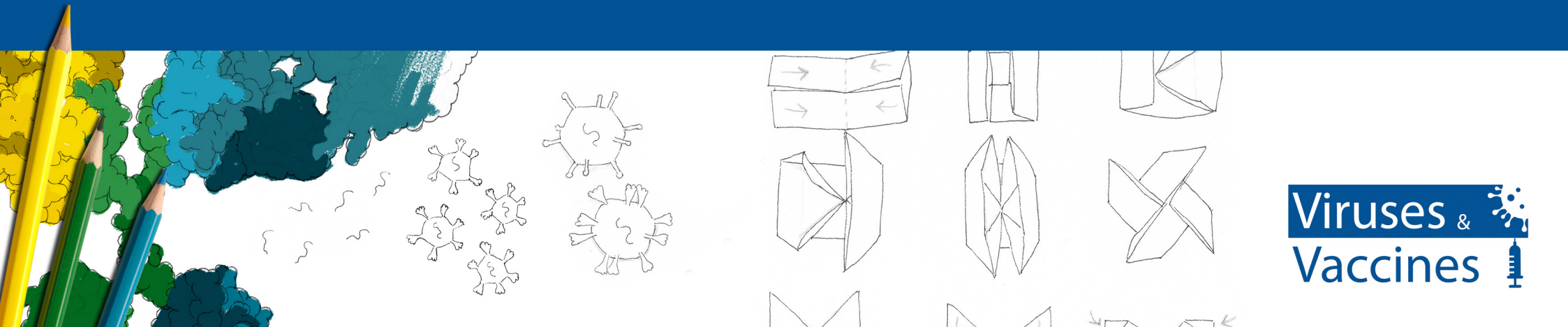


Coronavirus: inside & out



Coronavirus: inside & out

Everyone's life has been affected by SARS-CoV-2, the virus that causes COVID-19. Some people carry it without realising and can pass it to another person who can become seriously unwell. We all need to look after each other through distancing and wearing masks. Thankfully, scientists across the world have worked together to find a way to create vaccines to protect us. Learn about this fascinating virus and how vaccines work. We hope this resource will inspire you to get creative, learn and have fun.

Viruses are so small they can usually only be seen with a special microscope using electrons to take pictures. The 'Virus collection' drawings are based on electron microscope images but they are quite fuzzy. These more detailed drawings of the virus are based on computer models where scientists have worked out the structure of each part. We enter a tiny world.

1. Spike (S) protein – the virus uses this to attach and enter a cell (the basic unit of our body). Seen from above, they are a triangular shape.

2. Membrane (M) protein – they come in pairs

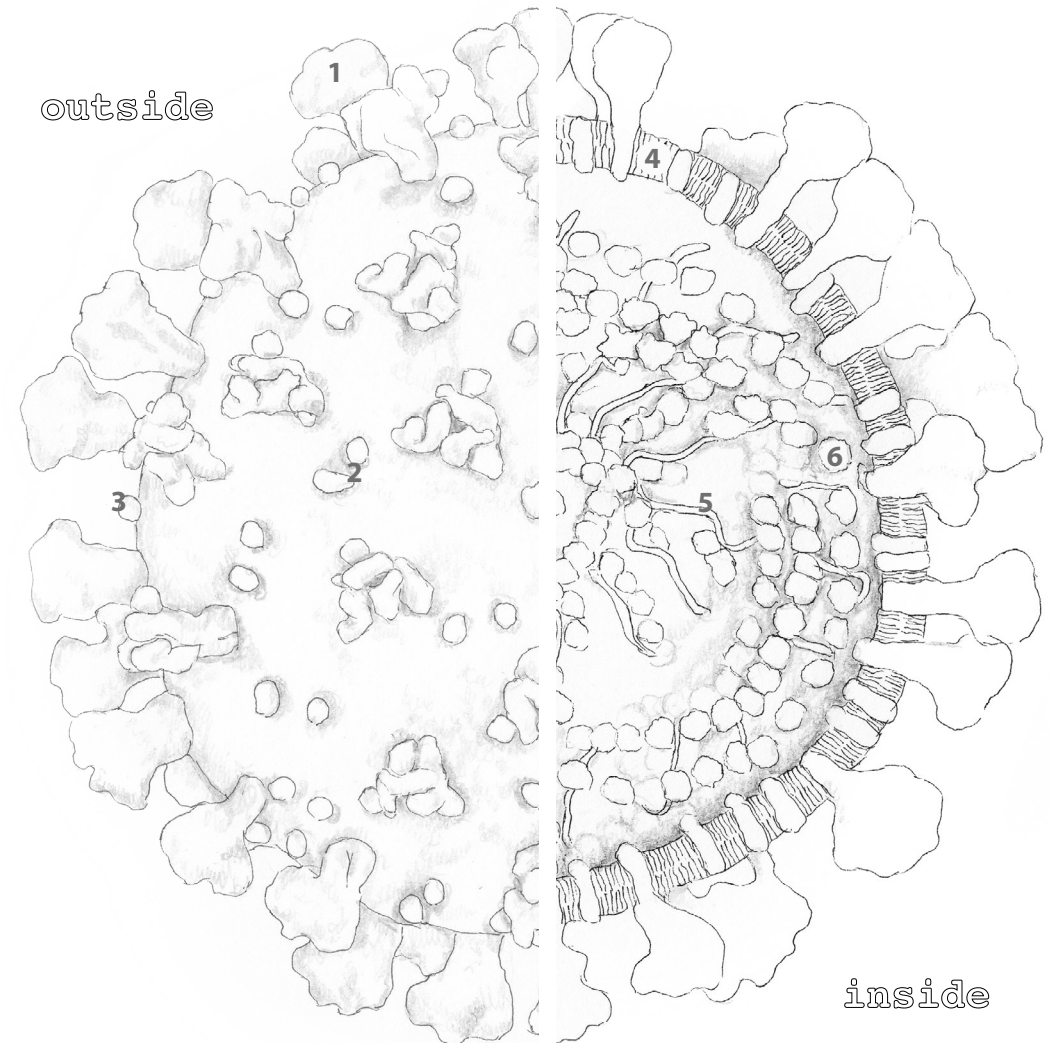
3. Envelope (E) protein – forms a pore with a five-fold symmetry

4. Membrane – a fatty outer layer, which means this virus can be damaged by soap

5. Genetic material (RNA) – instructions to make the virus

6. Nucleoprotein (N) – may help with the structure for spacing out spikes and packing the RNA

SARS-CoV-2



Coronavirus: outside

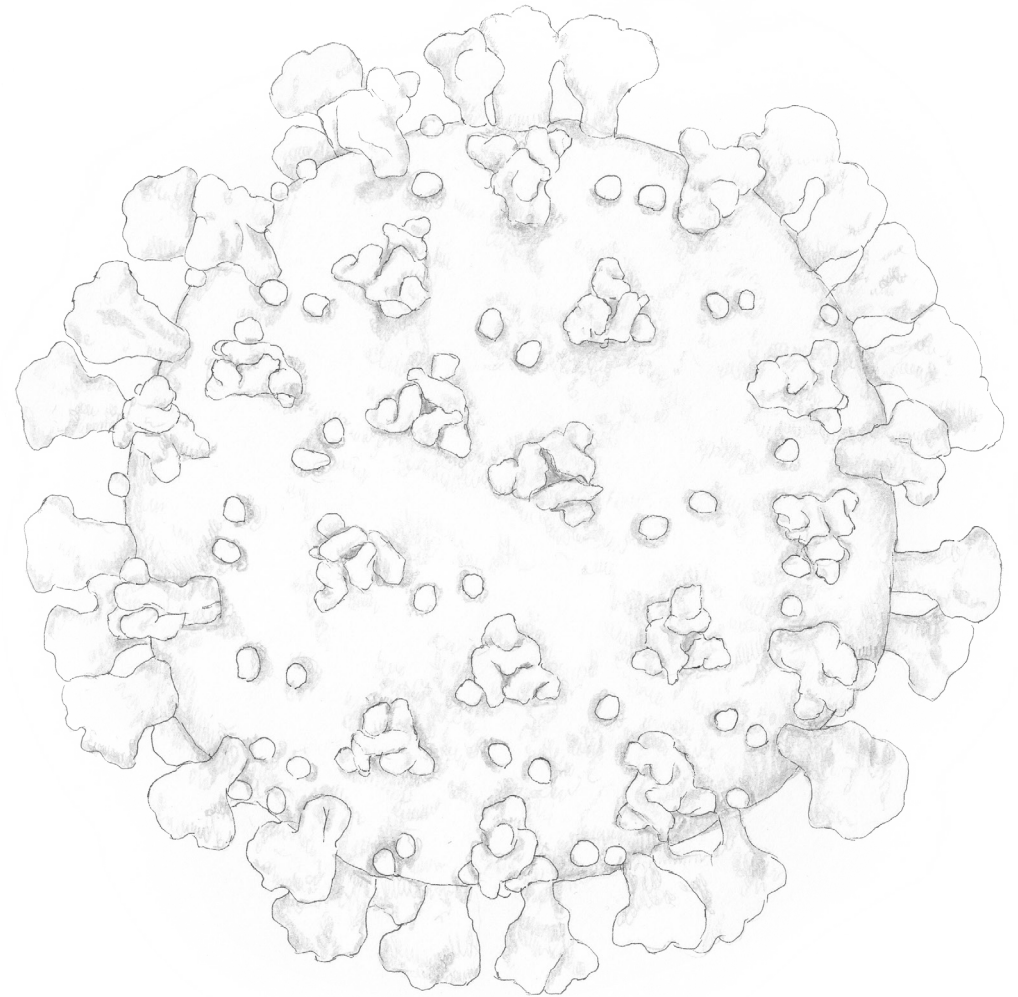
'Corona' comes from Latin meaning 'garland, wreath, crown' and is used to describe sun rays – 'solar corona'. Under the microscope, the spikes of the coronavirus look a bit like sun rays. Around a fifth of colds are caused by coronaviruses, but this novel coronavirus (SARS-CoV-2) is different and causes COVID-19.

Add colour and decorate the outside of this virus. The drawing can be cut out and matched up to the next picture showing the inside of the virus. The drawings could be hung up and spun to see the inside and outside of this virus.

In more detail: The distinctive crown-like spikes allow the virus to attach to a cell (building block of our body) and enter it. SARS-CoV-2 attaches to a protein on the outside of cells called ACE2.

The virus is surrounded by a fatty membrane called an envelope, which wraps around its viral genetic material (RNA). Soap dissolves fat and therefore can dissolve the virus's fatty membrane and destroy the virus.

SARS-CoV-2 can be caught from droplets in the air from the breath of someone who is infected, through speaking or coughing. Any one of us can be infected without realising, so it's important we keep a two metre distance and wear masks. Coronavirus can also be caught from touching a surface touched by someone who is infected. It can then infect someone after unclean fingers touch eyes, nose or mouth. This is why it's important to wash our hands.



Coronavirus: inside

Inside a virus is genetic material containing instructions to make more viruses after hijacking a cell. The information for making viruses can be in the form of DNA or RNA. Coronaviruses are RNA viruses.

Add colour and decorate the inside of the virus. This drawing can be cut out and stuck back to back to show the inside and outside of the virus.

In more detail: The RNA inside this novel coronavirus is close to 30,000 bases or letters, which is quite big for an RNA virus. The genome encodes at least 29 proteins. Any changes (mutations) in the letters encoding proteins can lead to new variants, which may affect how a virus is transmitted or how it affects a person.

