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Microorganisms

Microorganisms are tiny. They are so small they can only be seen with a microscope. Yeast is a helpful microorganism which makes bread rise. Bacteria is a microorganism which breaks down plants into nutrients.

Microorganisms are also known as 'germs'. Harmful germs can make us unwell. Good hygiene will avoid spreading these germs. Use soap and hot water to wash your hands after preparing food or using the toilet. This will kill bacteria.

There are three types of microorganisms: yeast, bacteria and viruses.

Viruses

Viruses are not alive because they do not complete all of the seven life processes: Movement, Respiration, Sensitivity, Nutrition, Excretion, Reproduction and Growth.

We say 'strains' of virus and not species. They are made of a relatively short length of genetic material DNA which is surrounded by a protein coat.

The life cycle of a virus is the same as other pathogens. They can often survive outside a host for long periods of time. When they have infected a suitable host cell or cells, they replicate themselves within the cell thousands of times. They do not divide and reproduce, but replicate their DNA and protein coats. These are then assembled into new virus particles. The host cell or cells then burst and other nearby cells can be infected with the virus.

So what is the coronous virus or COVID-19?

The coronavirus, officially called Sars-CoV-2, can invade your body when you breathe it in (after someone coughs nearby) or you touch a contaminated surface and then your face.

Covid-19 is a mild infection for eight out of 10 people who get it and the core symptoms are a fever and a cough.

This stage lasts about a week - at which point most recover because their immune system has fought off the virus.



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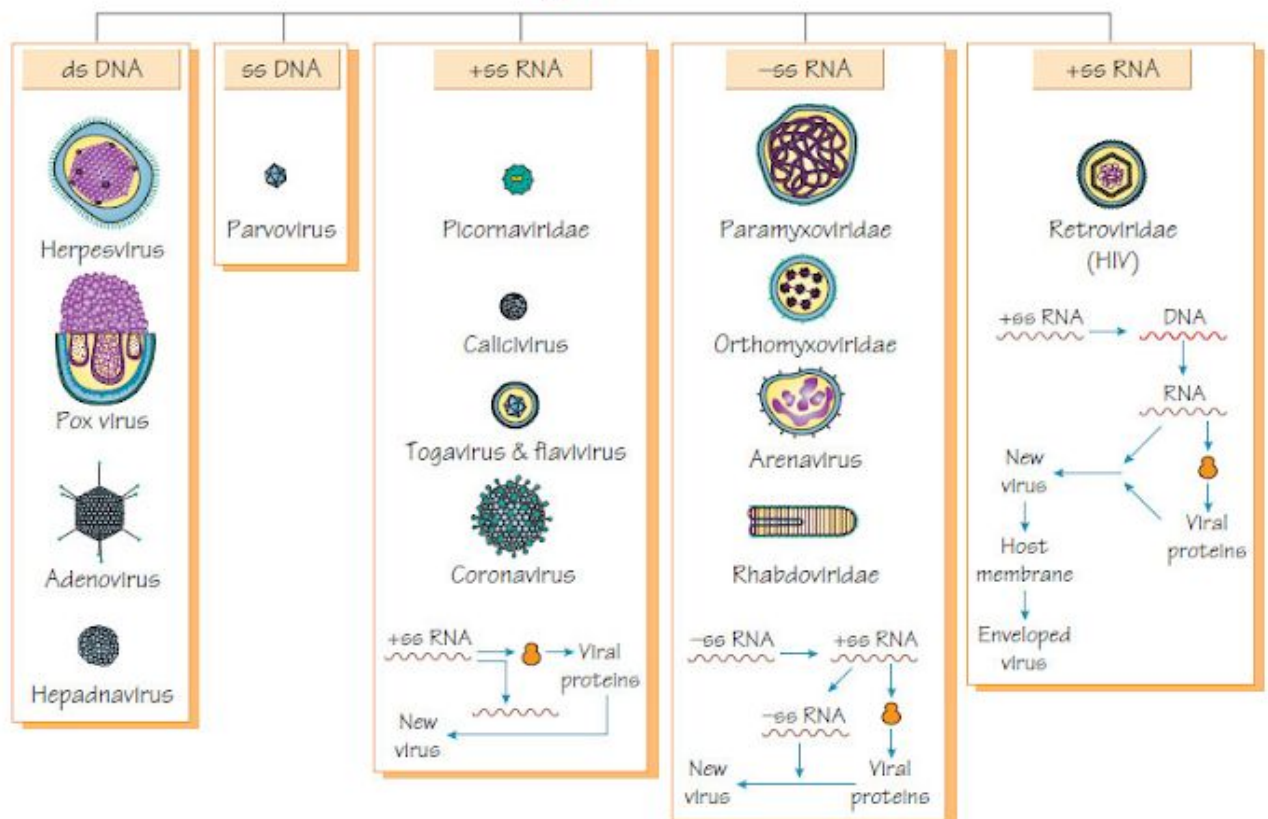
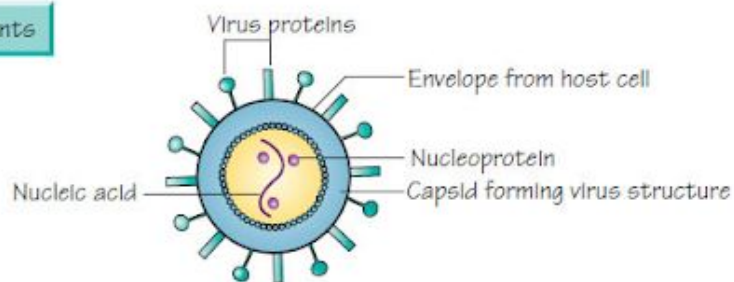
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What makes a virus clever?

Viruses are tiny, 500 million can fit onto a pinhead! They contain genetic material which is either DNA or RNA and are surrounded by a protective coat. They can live inside other animals and make copies of themselves.

Possible structural components



Above are some examples of viruses, have you heard of any of these?



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DNA viruses

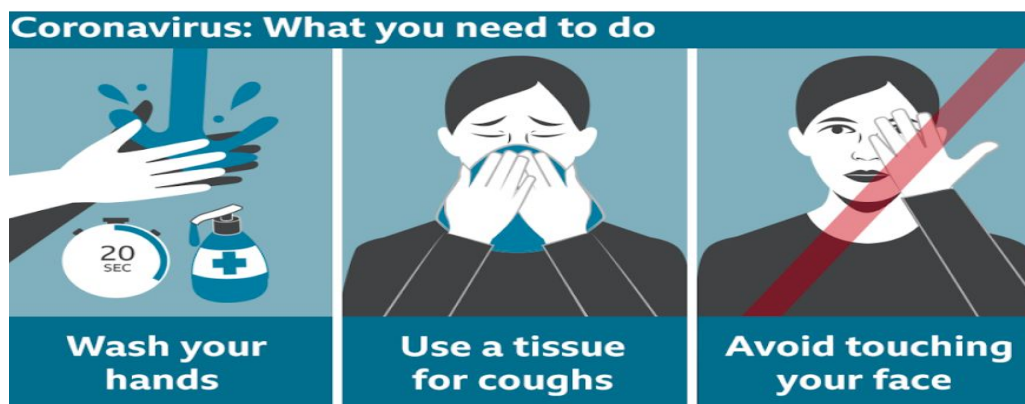
- Double-stranded DNA viruses include poxviruses (including chickenpox), herpesviruses (cold sores), adenoviruses (common cold), papovaviruses and polyomaviruses.
- Single-stranded DNA viruses include parvoviruses. DNA viruses usually replicate in the nucleus of host cells by producing a polymerase that reproduces viral DNA. Viral DNA is not usually incorporated into host chromosomal DNA.

RNA viruses

RNA viruses possess a single strand of RNA and adopt different reproductive strategies:

- RNA sense (positive) may serve directly as mRNA and be translated into structural protein and an RNA-dependent RNA polymerase.
- RNA antisense (negative) contains an RNA-dependent RNA polymerase that transcribes the viral genome into mRNA. Alternatively, the transcribed RNA can act as a template for further viral (antisense) RNA.
- Retroviruses have single-stranded sense RNA that cannot act as mRNA. This is transcribed into DNA by reverse transcriptase and incorporated into host DNA. The subsequent transcription to make mRNA and viral genomic RNA is under the control of host transcriptase enzymes.

How can you stop the spread of coronavirus?





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Task one

Make a poster for a younger child explaining what a virus is and how they can stop the spread of viruses. You can use any virus you have read about above such as cold sores, chicken pox or the common cold.

Task two

You hear on the news that people are taking antibiotics to stop them getting a virus, make a poster explaining to them what they should be doing to stop getting a virus.

Task three

You know that each virus has different proteins on the outside layer protecting the genetic material. You are going to have to research what proteins are and how you could design an antiviral drug.

Task four

What is DNA and RNA, how do they make copies of themselves? And how is a virus different from bacteria and yeast?