

Science 1.11 AS 90950 Investigate biological ideas relating to interactions between humans and micro-organisms

Analysing Exemplars – Virus H1N1



Success Criteria: For each sentence identify main concept and what life process it relates to

Viral pathogens work by taking over cells and getting them to carry out viral cell replication rather than carrying out the processes they were designed to do. An example of this is “the flu”. The true flu, of which H1N1 is an example, is breathed into the lungs and throat of a person. If the immune system does not instantly destroy it then the flu can enter the cell of the linings of the lungs and throat and take over the lung lining cells and force them to make multiple copies of the H1N1 virus. When the copying is complete the cells burst and induce an attack of coughing in the person so as the viral components are expelled at about 100kmhr-1. (2) The virus stops the cells taking oxygen to the blood as they now are manufacturing viral cells. If too many cells are compromised then the lungs break down and death can result. This is why “flu” viral diseases are dangerous. Antibiotics do not work on viruses. Doctors try to keep you alive until your immune system forms a antibody and then can destroy the flu virus. (1) Countries combat flu attacks by producing vaccination programmes and make these vaccinations available to people at risk including those with asthma and other lung diseases. The flu vaccination is passive vaccination so needs to be produced yearly. (3)

General Introduction of the micro-organism group. 1 or 2 sentences to discuss main features and a labelled diagram of the micro-organism may be useful.

Specific Introduction of your microbe – a few sentences. May also include how the Pathogen is “caught” by the infected person. In this case the life process is reproduction – the absorption phase of the viral reproduction cycle

The specific area of the human that the microbe infects – each specific pathogen will infect different parts of the human body.
Viral reproduction – absorption, Entry and replication. A diagram of the viral replication cycle will be of use here.

Description of the symptoms that the virus causes. Link to the Assembly/release phase of the virus and damage to cells. Also linked to specific parts of the body.

Further consequences of the virus and the steps leading to death and serious illness if relevant.
Linked in virus to reproduction.

Treatment of the pathogen. If virus make note that antibiotics do not work.(Viruses are not living)
Relief of symptoms – how treatment and relief of symptoms link to the reproduction of viruses

Prevention of further infection or passing it on to another person. For viruses this includes hygiene practices, washing hands etc.
Could also include vaccination and how the production of antibodies can prevent reproduction of the virus – i.e. viruses are prevented from attaching to host cell

Can also include summary at end of lesson.

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Analysing Exemplars – Bacteria Salmonella



Success Criteria: For each sentence identify main concept and what life process it relates to

Bacterial pathogens are microscopic single celled prokaryote organisms that can cause disease in humans. Not all bacteria cause disease and most bacteria are useful to humans. The harmful one can kill us. Salmonella is a bacterium that can cause food poisoning in humans. It comes from contaminated food, (2) especially chicken. When the bacterium is eaten it travels through the stomach and lodges in the intestine. Here it attaches to the intestine wall and uses our wastes as its food supply. In carrying out its living processes it excretes wastes into our intestine. These wastes are a neurotoxin to humans and stop our intestine functioning correctly. The large intestine cannot absorb water correctly and so we suffer diarrhoea This then causes us to lose fluids and for some people the fluid loss can lead to thickening of the blood and death. Bacteria can be treated with antibiotics. (1) One of the simplest ways to treat salmonella is to stop contamination of the bacteria. This can be done by covering food and storing in the fridge and especially by washing hands before a meal and after using the toilet. (3)

General Introduction of the micro-organism group. 1 or 2 sentences to discuss main features and a labelled diagram of the micro-organism may be useful.

Specific Introduction of your microbe – a few sentences. May also include how the Pathogen is “caught” by the infected person. Link the spread of the bacteria to the phase of the reproduction life cycle and/or structures that enable it to survive between hosts

Further detail on the spread of bacteria. In this case the life process could be growth – the reason why the chicken causes the bacteria to grow so rapidly and there are much more bacteria than say the kitchen bench

The specific area of the human that the microbe infects – each specific pathogen will infect different parts of the human body. Viral reproduction – absorption, Entry and replication. A diagram of the viral replication cycle will be of use here.

Description of the symptoms that the virus causes. Link to the excretion of the bacteria and damage to cells. Also linked to specific parts of the body.

Further consequences of the bacteria and the steps leading to death and serious illness if relevant. Linked in bacteria to reproduction (asexual) and why the numbers of bacteria and the damage they do can occur so quickly.

Treatment of the pathogen. If bacteria make note that antibiotics can be effective by preventing a life function (normally reproduction) taking place – add specifics.

Relief of symptoms – how treatment and relief of symptoms link to stopping the reproduction or growth of bacteria

Prevention of further infection or passing it on to another person. For bacteria this includes hygiene practices, washing hands etc. (Vaccination does not help prevent bacterial infection) link to growth of bacteria and how these actions reduce or prevent the growth of bacteria by removing conditions needed