Your notes

GCSE Biology: revision notes

Communicable diseases and pathogens

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Start here: what causes disease

- A **pathogen** is a microorganism that causes disease. There are four kinds: bacteria, viruses, fungi and protists.
- **Pathogens** spread through the air (coughs and sneezes), by direct contact, or in water and food.
- Bacteria and viruses make you ill in different ways: bacteria give off **toxins** (poisons) that damage tissues, while viruses live and reproduce inside your cells and damage them.

Pathogens

- **Pathogens** are microorganisms that cause infectious (communicable) disease. They can be viruses, bacteria, protists or fungi.
- Bacteria reproduce rapidly inside the body and may produce **toxins** that damage tissues and make us feel ill.
- Viruses live and reproduce inside cells, causing cell damage.
- **Pathogens** spread by direct contact, by water or through the air (for example in droplets from coughs and sneezes).
- Spread can be reduced by good hygiene, destroying **vectors**, isolating infected people and vaccination.

Viral diseases

- **Measles**: fever and a red skin rash. It spreads by inhaling droplets from sneezes and coughs. It can be fatal, so young children are vaccinated.

- HIV: at first a flu-like illness. It attacks the body's immune cells; without treatment, late-stage HIV infection (AIDS) leaves the immune system unable to fight other infections. It spreads by sexual contact or exchange of body fluids such as blood, for example when drug users share needles. Antiretroviral drugs control it.
- **Tobacco mosaic virus** (TMV): infects plants such as tomatoes, giving a mosaic pattern of discoloured leaves. This reduces photosynthesis and growth.

Bacterial diseases

- **Salmonella** food poisoning: fever, abdominal cramps, vomiting and diarrhoea, caused by the bacteria and the **toxins** they produce. It spreads through undercooked food or food prepared in unhygienic conditions. Poultry in the UK is vaccinated against **Salmonella**.
- **Gonorrhoea**: a sexually transmitted disease causing a thick yellow or green discharge and pain on urinating. It used to be treated with penicillin, but many strains are now resistant. It is controlled by antibiotics and by using condoms.

Fungal and protist diseases

- **Rose black spot** is a fungal disease: purple or black spots appear on leaves, which turn yellow and drop early, reducing photosynthesis. Spores spread by water or wind. It is treated with fungicides and by removing and destroying affected leaves.
- **Malaria** is caused by a protist. Its life cycle includes the mosquito, which is a **vector**. It causes repeated episodes of fever and can be fatal.
- **Malaria** is controlled by preventing mosquitoes from breeding and by using mosquito nets to avoid being bitten.

Exam tip

- Learn each named disease with its **pathogen**, how it spreads and how it's treated or stopped. Questions tend to ask for exactly that.

Common mistakes

- Saying antibiotics kill viruses. They only work on bacteria.
- Confusing symptoms with what causes them: bacteria release **toxins**, whereas viruses damage the cells they live in.

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Worked examples

A bacterium divides every 20 minutes. Starting with one, how many bacteria are there after 2 hours?

Work out how many divisions: 2 hours is 120 minutes. **120 ÷ 20 = 6 divisions**

Each division doubles the number. **$2^6 = 64$**

Answer: 64 bacteria

Key terms

Pathogen	A microorganism that causes disease, such as a virus, bacterium, protist or fungus.
Communicable disease	A disease that can spread from one person or organism to another.
Toxin	A poison produced by bacteria that damages tissues.
Vector	An organism, such as a mosquito, that carries a pathogen from one host to another.
Measles	A viral disease causing fever and a red rash, spread by droplets.
HIV	A virus that attacks the immune system; without treatment it leads to AIDS.
Tobacco mosaic virus	A plant virus that causes a mosaic pattern of discoloured leaves.
Salmonella	Bacteria that cause food poisoning.
Gonorrhoea	A sexually transmitted bacterial disease.
Malaria	A disease caused by a protist and spread by mosquitoes.
Rose black spot	A fungal disease of roses causing black spots on leaves.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What type of pathogen causes measles?
2. What type of pathogen causes malaria?
3. How is malaria spread?
4. What causes the symptoms of Salmonella food poisoning?
5. How do viruses cause damage?
6. Which disease is caused by a fungus?
7. How can the spread of gonorrhoea be reduced?
8. What does TMV do to a plant?

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Answers

1. Virus
2. Protist
3. By mosquitoes, which are vectors
4. The bacteria and the toxins they produce
5. They reproduce inside cells, damaging them
6. Rose black spot
7. Using condoms and treating people with antibiotics
8. Discolours leaves, reducing photosynthesis

What to do next

Practise 12 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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