Exercise walk-through

3.1 Communicable diseases and pathogens (4.3.1.1–4.3.1.5)

AQA · GCSE · Biology

Pathogens and how diseases spread

- **bacteria** , which reproduce quickly and may release **toxins** (poisons) that damage tissues;
- **viruses** , which live and reproduce inside **host cells** , damaging them when they burst out;
- **protists** , single-celled organisms such as the one that causes malaria;

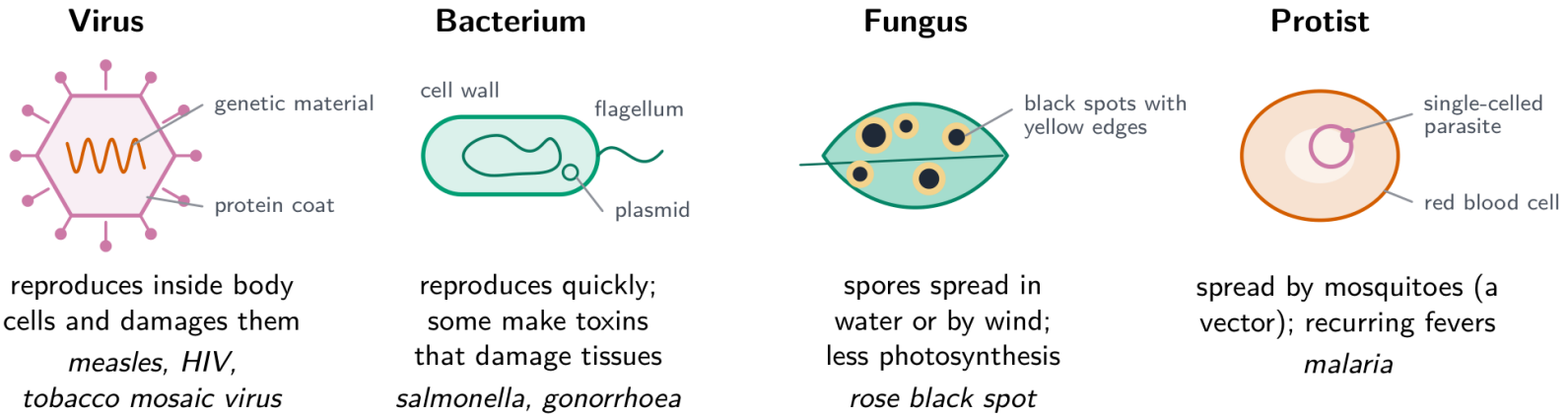
Pathogens and how diseases spread (2)

- **fungi** , some of which grow as threads or spread by spores.
- hygiene, such as washing hands and covering coughs;
- isolating infected people, animals or plants;

Pathogens and how diseases spread (3)

- destroying or controlling vectors;
- **vaccination**.

Figure: Pathogens and how diseases spread



not to scale: a virus is about a hundred times smaller than a bacterium

- The four types of pathogen: virus, bacterium, protist and fungus (not to scale)
- Match each part of the diagram to the text.

Named diseases

- In malaria, the mosquito is the **vector** and the protist is the pathogen.
- A mosquito that bites an infected person takes in the protist and can pass it on with its next bite.
- **Worked example 1. TMV** makes parts of the leaves pale.
- Explain why infected plants grow less.

Exercises 2.1·2.2

2.1 Name the kind of pathogen that causes each disease: measles and rose black spot. [2]

measles | rose black spot

2.2 Malaria is spread by mosquitoes. Give the name for an animal that spreads a disease, and **one** way to reduce the spread of malaria. [2]



Exercises 2.1·2.2

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measles | rose black spot

2.1

- measles: a **virus**; rose black spot: a **fungus**

2.2 Malaria is spread by mosquitoes. Give the name for an animal that spreads a disease, and **one** way to reduce the spread of malaria. [2]

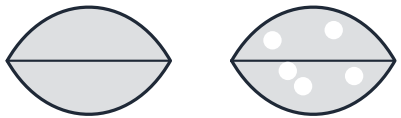


2.2

- a **vector**; any one: mosquito nets; insecticides; drain standing water; antimalarial drugs

Exercise 2.3

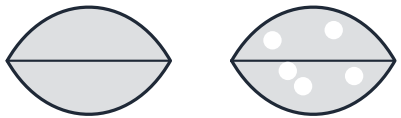
2.3 A tobacco plant is infected with tobacco mosaic virus. Explain why the plant grows less. [2]



healthy infected

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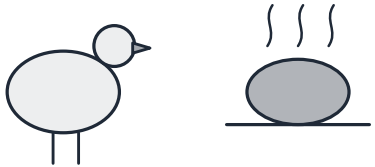
healthy infected

2.3

- parts of the leaves lose their colour (less chlorophyll); so there is less photosynthesis and less glucose for growth

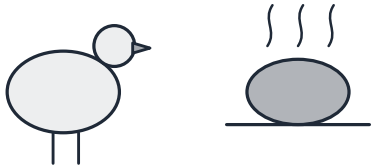
Exercise 3.1

3.1 *Salmonella* bacteria cause food poisoning. Explain how vaccinating chickens and cooking chicken well both reduce cases of food poisoning. [3]



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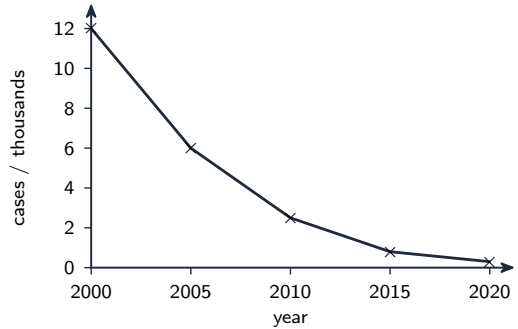
- vaccinated chickens are not infected, so there are no *Salmonella* in the meat or eggs
- cooking at a high temperature kills any bacteria in the meat
- fewer live bacteria are eaten, so fewer toxins are made in the gut and fewer people get ill

Exercise 3.2 (a)

3.2 The graph shows the number of measles cases in a country. The table shows the percentage of children vaccinated.

year	**2000**	**2005**	**2010**	**2015**	**2020**
children vaccinated / %	60	75	85	92	95
measles cases	12 000	6000	2500	800	300

(a) Describe how the number of cases changed as more children were vaccinated. [2]

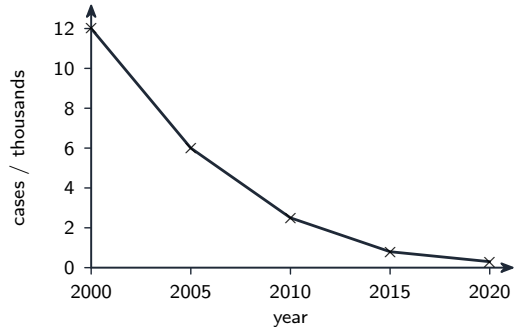


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(a) as the percentage vaccinated went up, the number of cases went down; it fell fastest between 2000 and 2010, then levelled off

Exercise 3.2 (b)

3.2 The graph shows the number of measles cases in a country. The table shows the percentage of children vaccinated.

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(b) decrease $= 12\,000 - 300 = 11\,700$; $\frac{11\,700}{12\,000} \times 100 = \mathbf{97.5}\%$

Exercise 3.2 (c)

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(c) Not every child was vaccinated, but the number of cases still fell to a very low level. Explain why. [2]

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(c) most people are immune, so the virus cannot spread easily from person to person; unvaccinated children are unlikely to meet an infected person (herd immunity)

Exercise 3.2 (d)

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(d) Measles is caused by a virus, gonorrhoea by a bacterium and malaria by a protist. Explain how the spread of each of these diseases can be reduced. [6]

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(d) points to include:

- measles spreads in droplets from coughs and sneezes: vaccinate children; isolate infected people
- gonorrhoea spreads by sexual contact: use condoms; treat infected people and their partners with antibiotics
- malaria is spread by mosquitoes: use nets, insecticides and drain standing water
- antimalarial drugs stop the protist in infected people
- in each case, breaking the route of spread reduces the number of new infections

Levels: **5–6** a full, logical answer with correct biology and correct terms; **3–4** several correct points, partly linked; **1–2** one or two relevant points.