

Name: \_\_\_\_\_

# GCSE

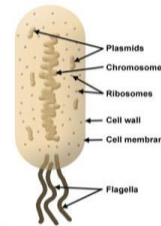
# Infection and

# Disease Booklet

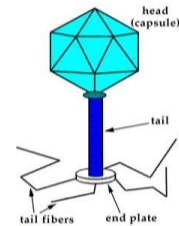
LESSON CONTENT		😊	😐	😞
1	Pathogens			
2	Bacterial, viral and fungal diseases			
3 & 4	Microbiology: culturing microorganisms & <b>Counting bacterial numbers</b>			
5	Protist diseases			
6	Body defences			
7	White blood cells and <b>Monoclonal antibodies</b>			
8	Vaccinations			
9	Antibiotics			
10	<b>Measuring the Effect RP</b>			
11	Antibiotic resistance			
12	Developing drugs and Painkillers			
13	Plant diseases and identification			
14	Plant defences			

BACTERIA	VIRUSES	FUNGI
Need Microscope to see them	Smaller than Bacteria	Single Cells (Yeast) or threads (Mushrooms)
Need warmth, moisture, nutrients	Depend on living hosts	Need warmth, moisture, nutrients
Divided into Aerobes and Anaerobes	'Non' Living	Aerobes or Anaerobes
Saprophytes or Parasites	Always Parasites	Saprophytes or Parasites
Can be harmful or Useful	Always Harmful	Can be Harmful or Useful
Harmful: cause diseases, eg tetanus, TB, pneumonia, sore throats, food poisoning, Cholera etc	Cause diseases, eg Measles, Mumps, Poli, Flu, Cold Sores, Aids...	Cause diseases, may be poisonous, decay food
Uses: antibiotics, rot things		Uses: eaten, beer and bread making, antibiotics

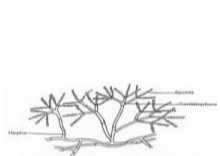
**Bacteria**



**Virus**



**Fungus**



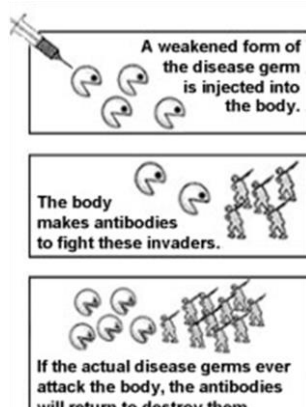
Infection Type	Bacterial	Fungal	Viral
Treatment	Antibiotic medication	Antifungal medication	None, or antiviral meds
Can antibiotics work?	Yes	No; Antifungals instead	No; Antivirals instead
Do vaccines exist for the infection?	Yes	Not many	Yes
Example	Staph infection, treated with penicillin	Ringworm, treated by miconazole	Influenza, treated by oseltamivir (Tamiflu)

### Vaccination (also called 'immunisation')

A vaccination makes a person immune to a disease caused by one particular bacterium or virus. The person is injected either with dead or inactivated versions of the pathogen, or just with its antigens. They aren't dangerous but the body doesn't realise that, so it defends itself by learning to make the right antibodies.

White blood cells learn to make the right shaped antibodies by practising on dead or broken pathogens

If the real, living pathogens get into the body, the white blood cells know immediately what shaped antibodies to make, rather than taking a while to get it right. So the pathogens get killed straight away and you don't get ill.



## Antibiotics

Antibiotics are a type of medicine. Some types of medicine, like paracetamol, lemsip or aspirin, treat **symptoms** of an illness (e.g. pain, fever), whereas antibiotics actually kill the pathogens which are making you ill. BUT – they only work on bacteria, not viruses. That's because viruses are hidden away inside your cells, where the antibiotics can't get to them.

Unfortunately, if we use antibiotics when we don't need to, *or* if we *don't* finish all the pills the doctor gives us, then bacteria are more likely to become **resistant** to the antibiotics.



## Three stages of testing drugs

New medical drugs have to be tested to ensure that they work, and are safe, before they can be prescribed. There are three main stages of testing.

1. The drugs are tested using computer models and human cells grown in the laboratory. Many substances fail this test because they damage cells or do not seem to work.
2. Drugs that pass the first stage are tested on animals. In the UK, new medicines have to undergo these tests. But it is illegal to test cosmetics and tobacco products on animals. A typical test involves giving a known amount of the substance to the animals, then monitoring them carefully for any side-effects.
3. Drugs that have passed animal tests are used in clinical trials. They are tested on healthy volunteers to check they are safe. The substances are then tested on people with the illness to ensure they are safe and that they work.



## Plant Diseases



**Black Rot of Crucifers**

**Caused by:**  
**Symptoms:** Presence of yellow brown V-shaped areas at the leaf margins and blackening nearby veins. Drying of affected leaf tissue.



**Late Blight of Potato**

**Caused by:**  
**Symptoms:** Appearance of dark blotches on leaf tips and plant stems. Infected tubers develop dark patches that are reddish brown beneath the skin.



**Bacterial Wilt of Tomato**

**Caused by:**  
**Symptoms:** Browning of vascular system of roots and lower portions of stems. Diseased stems cut and placed in water will show bacterial ooze.



**Hill Bunt (Smut) of Wheat**

**Caused by:**  
**Symptoms:** Discoloured grains consisting of brown to black mass. Periderm is thin and papery.



**Brown Spot of Rice**

**Caused by:**  
**Symptoms:** Brownish spots on the leaves and glumes of the plant.



**Tobacco Mosaic Viral Disease**

**Caused by:**  
**Symptoms:** Development of mottled pattern of light and dark green areas in the leaves and rugosity.



**Leaf (Brown) Rust of Wheat**

**Caused by:**  
**Symptoms:** Formation of circular to oval orange brown pustules raised above the leaf surface.



**Yellow Mosaic of Okra**

**Caused by:**  
**Symptoms:** Homogeneous interwoven network of yellow veins on leaves enclosing green tissue within.



**Red Rot of Sugarcane**

**Caused by:**  
**Symptoms:** Yellowing of leaves, shrinkage of stalk, reddish discoloured lesions on internal stalk tissue.



**Bacterial Blight of Cowpea**

**Caused by:**  
**Symptoms:** Water soaked spots on leaves.



**Powdery Mildew of Wheat**

**Caused by:**  
**Symptoms:** Cottony mycelia patches on leaf surfaces.



**Leaf Curl of Chilli**

**Caused by:**  
**Symptoms:** Leaf curls towards midrib and deforms.