

Year 9

Biology booklet

Topic 2 – microbes and disease

Name: _____

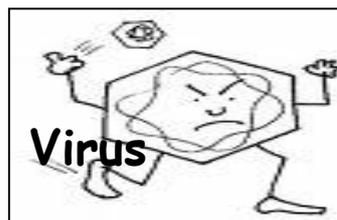
Microbes and disease

Give a definition for each of these key words:

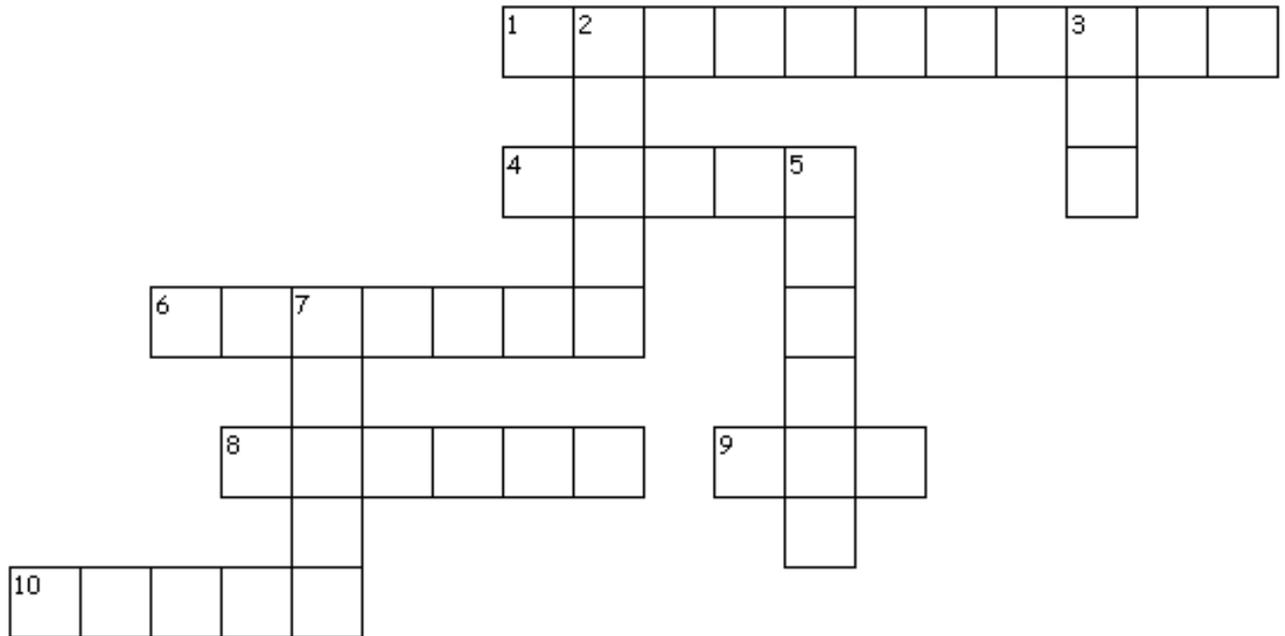
Micro-organism	
Pathogen	
Fungi	
Bacteria	
Protist	
Virus	
Immunity	
Antibody	
Antigen	
Vaccination	
Antibiotic	
Analgesic	
Placebo	
Blind trial	

Bacteria, viruses and fungi are all microbes. Match the descriptions to the microbe.

Produce Spores	Grow in colonies
Have a cell wall, cell membrane, cytoplasm and a few genes but no nucleus.	Sometimes this microbe has a "tail" (called flagella) to help it move
Can attack a cell by injecting its DNA into the cell.	This microbe can be used to make yoghurt.
This microbe can be used to make bread, beer and wine.	This microbe can be used to ripen cheeses.
These are the largest of the three microbes. Approximately 1µm long.	These are the smallest of the three microbes. They range in size from 10 to 300nm (nanometres).
These have a protein coat and strands of genes.	They are often shaped like rods, spheres or spirals.
They must infect a host to reproduce. They cannot live on their own.	They feed on living or dead organisms and their waste products.
They have a nucleus and cell wall.	Examples: Chicken pox, influenza
Examples: Athletes foot, thrush	Examples: Food poisoning, TB



Killing microbes



Across

1. ____ kill bacteria
4. Yeast is used to make _____
6. Yeast is a type of _____
8. _____ kills microbes
9. Chicken ____ is caused by a virus
10. To stay healthy we must wash our ____

Down

2. This person helps the doctor
3. Microbes can make you feel _____
5. When you are ill you go to the ____
7. White blood _____ protect you

Words to choose from

Hands
 Antibiotics
 Nurse
 Microbe
 Doctor
 Cells
 Pox
 Bleach
 Bread
 ill

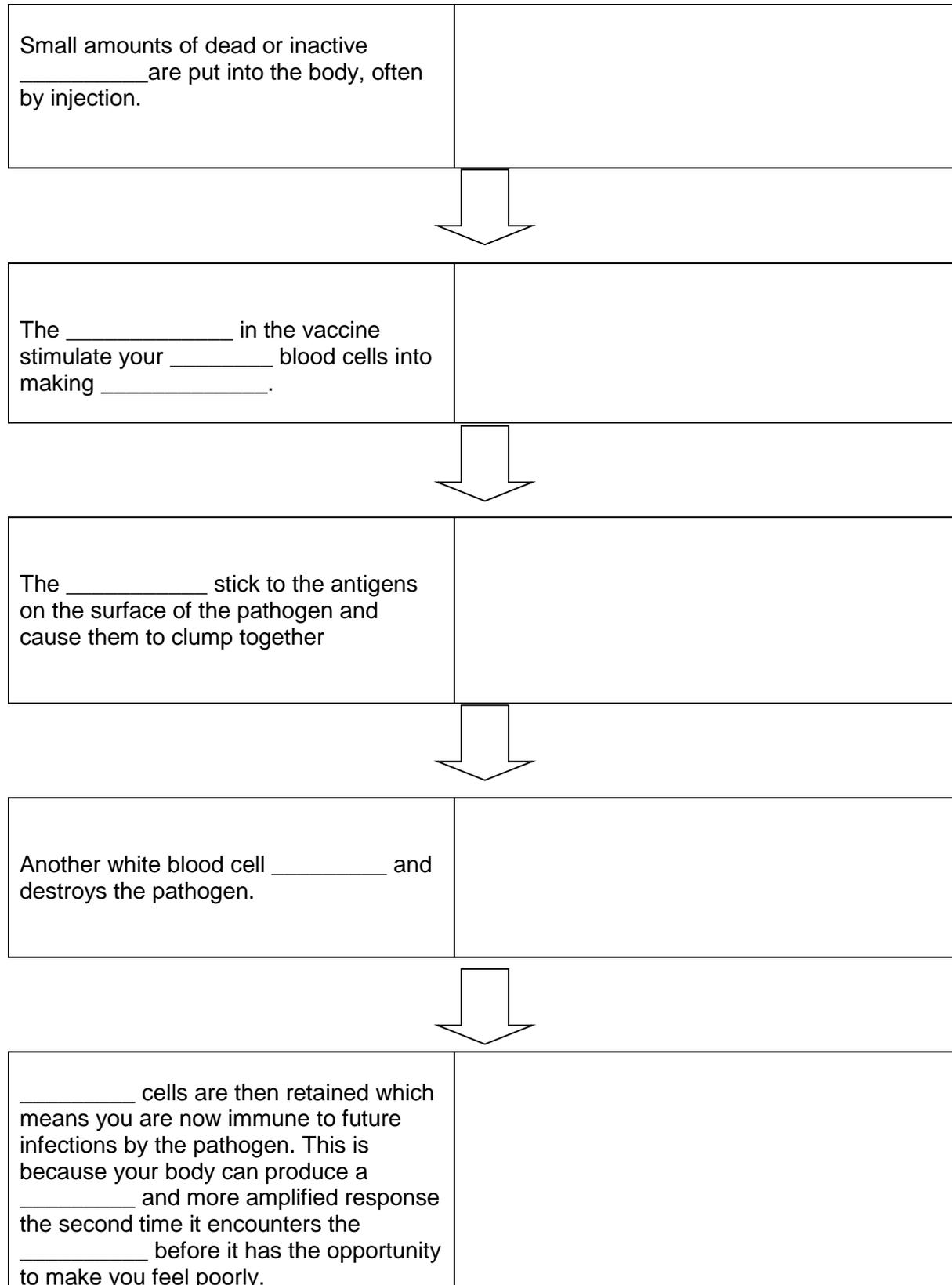
Defence against disease

Draw diagrams for each stage to show how white blood cells and antibodies help to protect us against disease

Some white blood cells engulf (surround and digest) microbes.	Other white blood cells make antibodies. This first time your body makes antibodies for a disease, it takes quite a long time.	Antibodies stick to the microbes.
The antibodies make the microbes clump together. This makes it easier for the microbes to be destroyed.	Some of the antibodies remain even after you have recovered and there are no microbes left.	The left-over antibodies mean that next time you get infected, your body produces more antibodies, more quickly.

How does a vaccine work?

Complete the blanks and add diagrams to explain how vaccines work



Pain is useful because it tells you that something is wrong. Many infections give us a _____ and aching _____. We may also get a _____ or feel shivery. Relieving the painful _____ is useful. _____ such as paracetamol or codeine can do this. They do not heal us but make us feel better while our _____ system or _____ kill the pathogens.

	True or False
Antibiotics can kill viruses if we take enough of them.	
Penicillin can treat MRSA.	
Antibiotics cause bacteria to mutate.	
Painkillers only treat the symptoms and do not cure.	
Pain is useful because it lets us know we are ill.	
'Symptoms' of a disease are what we feel, such as a headache; 'signs' are what others can see, such as a rash.	
Codeine is made from opium poppies.	
Some people are allergic to penicillin.	
Some people are resistant to antibiotics.	
Penicillin kills all types of bacteria.	
Before we had antibiotics, the majority of soldiers who died succumbed to infections from their wounds.	
Most of us have MRSA in our noses.	

Drug Development Process

Put the following statements in order to show the drug development process.

Double blind randomised trials involve large numbers of patients. Some are given the new medicine and some a placebo that does nothing at all. Neither the patients nor the people giving them the medicine know which group is which.

The **first clinical trial** is where new medicines are tested on healthy people to make sure there are no unexpected side effects.

Doctors prescribe licensed medicines, but they continue to monitor the effects on patients. This is sometimes called the 'phase 4' clinical trial.

Scientists study bodies and diseases to see how they work. They try to find '**targets**' for medicines to aim at. Targets are things that cause diseases such as tiny protein molecules.

Computers and cell samples are used to find chemicals that seem to work on the target. Tens of thousands of known chemicals are tested like this.

If a medicine passes all the clinical trials it can get a licence from the government which means doctors can use it.

The second clinical trial involves a much bigger group of patients, to see if the drug works on the disease it is designed for.

The most promising treatments are tested to see how much is safe and how much is poisonous.

Scientists need to know how quickly and where the body absorbs the chemical and how quickly it flushes it out.