

Name:
Science Class:
Teacher:
Hand in day:

Y8 Science
Term 3: Homework Booklet
Biology

	Hand in Date	Parents Signature
Health and Disease		
Homework 1		
Homework 2		
Homework 3		
Homework 4		

Health and Disease: Homework 1

Comprehension Task

An **infectious disease** is any disease caused by a **pathogen** that can be passed from person to person. A pathogen is the scientific name for “germ” and is a microorganism that invades the body and **damages cells** and tissues, making us feel ill.

There are four main types of pathogens: **viruses, bacteria, fungi and protists**.

The First Line of Defence

The body is constantly defending itself against attacks from pathogens. The **first line of defence** against infection stops the pathogens from entering the body. These first lines are not specific to fight against certain types of pathogen. They include:

- Skin
- Nose
- Trachea and Bronchi
- Stomach

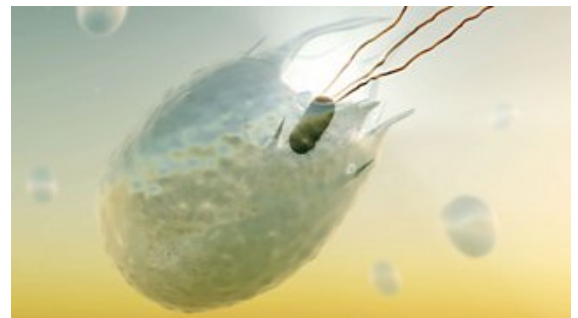
The Immune System

If pathogens manage to pass the non-specific first line of defence then they will cause an infection. However, the body has a second line of defence to stop or minimise this infection. This is called the immune system. As a part of this there are two types of white blood cell called **phagocytes** and **lymphocytes**.

Phagocytes

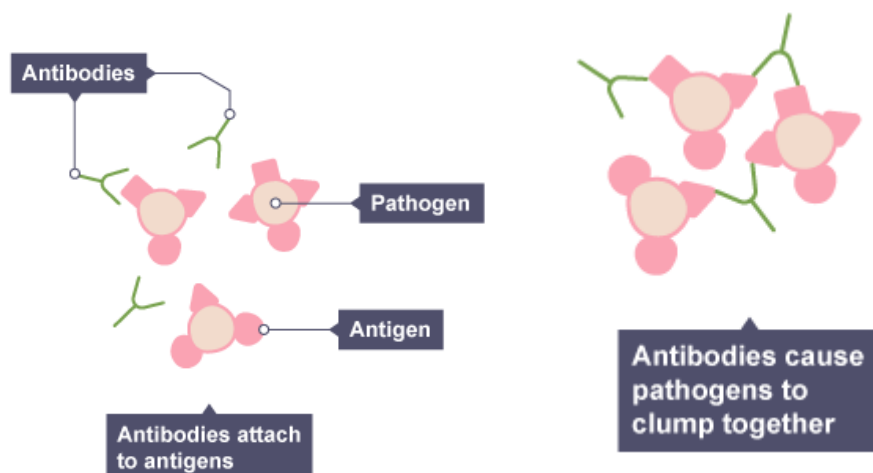
Phagocytes are **white blood cells** that are attracted to pathogens and attach to them. Once they have attached to the pathogen, the phagocyte's cell membrane surrounds the pathogen and engulfs it. This means the pathogen is taken inside of the phagocyte.

Enzymes found inside the phagocyte break down the pathogen and destroy it. Phagocytes do this to all pathogens that they encounter, so they are called 'non-specific'.



Lymphocytes

Lymphocytes are another type of white blood cell. They recognise proteins on the surface of pathogens called **antigens**. Lymphocytes detect that these pathogen antigens are foreign and not naturally occurring within the body, leading the lymphocyte to produce **antibodies**. This process can take a few days, during which time a person may feel ill. The antibodies are released into the blood and bind to pathogens. This causes the pathogens to **stick together**, restricting their movement around the body and making it easier for phagocytes to engulf and then destroy them.



Questions

1. What is a pathogen?
2. How do pathogens make us feel ill?
3. List the 4 types of pathogen.
4. Which parts of the body make up the first line of defence?
5. Name two types of white blood cell.
6. What do enzymes inside phagocytes do?
7. What are antigens?
8. What do lymphocytes produce?

Health and Disease: Homework 2

1. Using the knowledge organiser and your own class notes to help, complete the table to compare Bacteria and Viruses:

	Bacteria	Virus
Are they living?		
How do they make us ill?		
What diseases do they cause?		

2. Describe how the nose and the stomach help prevent pathogens entering your body (use the knowledge organiser to help):

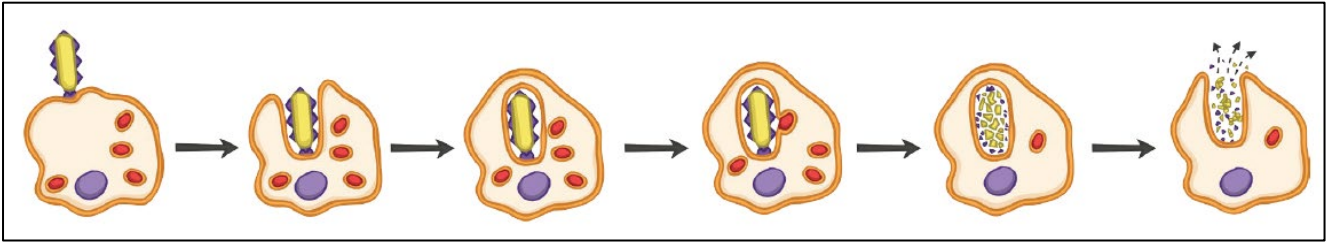
Nose:

Stomach:

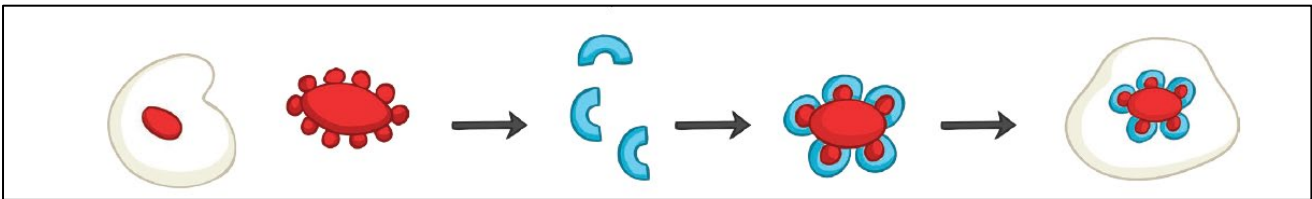
Health and Disease: Homework 3

The **second line of defence** involves the **immune system**, specifically **white blood cells**.

Complete the sentences below to describe the **role of the white blood cells**:



1. Some w_____ blood cells (p_____)
surround the p_____ and release e_____
to digest and break it down to d_____ it.
This process is known as p_____.



2. Other white blood cells (l_____) produce
a_____. Antibodies attach to the
s_____ of the pathogens. Pathogens have markers on
their surface called a_____. The antibodies are
complementary to the antigens on the pathogen so f_____ together.
Once attached, they cause s_____ pathogens to
s_____ together, making it easier for
p_____ to take place.

3. What is the third way that white blood cells can protect us against pathogens?

Health and Disease: Homework 4

1. Number the statements below to explain how a vaccine works (the first and last have been done for you):

White blood cells detect the antigens as a foreign body.	
If the pathogen re-enters the body, the antibodies are mass produced very quickly, preventing re-infection.	6
A small amount of dead or inactive pathogen is injected into the body.	1
Memory white blood cells are produced.	
The pathogen has an antigen on its surface.	
White blood cells produce antibodies which lock onto the antigens destroying the pathogen.	

2. Complete the exam question below:

Chickenpox is a disease. Many children get chickenpox.

Most children recover quickly with no serious long term effects.

Chickenpox cannot be treated with antibiotics.

- (a) What type of pathogen causes chickenpox (bacteria, virus, fungi or protest)?

(1)

People can pay for their child to be vaccinated against chickenpox.

The vaccination stimulates the production of antibodies.

- (b) Which part of the blood produces antibodies?

Tick **one** box.

Plasma

Platelets

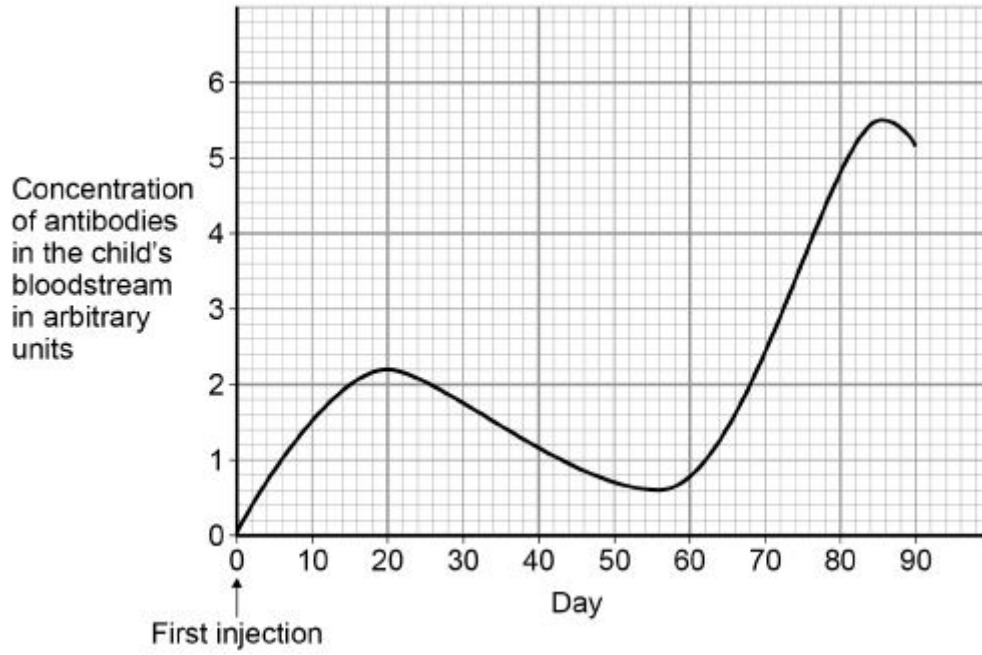
Red blood cells

White blood cells

(1)

The vaccination involves two injections.

The graph below shows how the concentration of antibodies in a child's bloodstream changes.



(c) Suggest on what day the second injection was given.

Day = _____ (1)

(d) On which day is the child's ability to defend against chickenpox at its peak?

Day = _____ (1)

Children can only have the chickenpox vaccination if their parents pay for the vaccine.

Some people think the vaccination should be free to all children.

- (e) If more people were vaccinated the number of children getting chickenpox would decrease.

What are **two** possible reasons for this decrease?

Tick **two** boxes.

Drugs to treat chickenpox are no longer effective

Children are less likely to come into contact with someone with the disease

More people will have the correct antibodies

People may catch the disease from the vaccination

People may have a weakened immune system

(2)

(Total 6 marks)