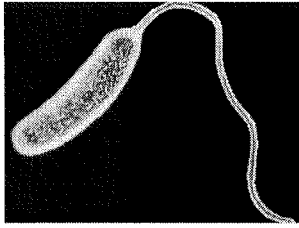


# BIOLOGY INDUCTION

## ACTIVITY



The human gut is home to millions of bacteria. They rarely cause any significant damage; in fact they largely benefit us by fermenting undigested foods, releasing vitamins. These harmless bacteria should not be confused 'germs', disease-causing bacteria. Cholera is an example of a disease-causing bacteria; it is an infection of the small intestine. Worldwide it affects 3-5 million people and causes 100,000-130,000 deaths a year as of 2010.

From a local disease, cholera became one of the most widespread and deadly diseases of the 19th century, killing an estimated tens of millions of people. In Russia alone, between 1847 and 1851, more than one million people had perished of the disease. It killed 150,000 Americans during the second pandemic. Between 1900 and 1920, perhaps eight million people died of cholera in India. Cholera became the first reportable disease in the United States due to the significant effects it had on health. John Snow, in 1854, was the first to identify the importance of contaminated water in its cause. He is now considered one of the fathers of modern epidemiology.



In your first biology lesson you will be working in groups to illustrate the key points on cholera. Use the resources in the boxes to answer these questions A4 paper in as much detail as you can and **bring your answers to your first lesson.**

At the bottom of the page are some websites and youtube clips that will help you.

1. There are two types of organisms – prokaryotic and eukaryotic. Prokaryotic organisms are made up of prokaryotic cells and eukaryotic organisms are made up of eukaryotic cells.
  - a. What is the difference between a prokaryotic and eukaryotic cell?
  - b. Is the organism that causes cholera prokaryotic or eukaryotic?
  - c. What is meant by a pathogen?
  - d. Give an example of a pathogenic organism.
2. Name the organism that causes cholera.
3. What are the signs and symptoms of cholera?
4. How is cholera transmitted from person to person?
5. Describe how the spread of cholera can be prevented.
6. What is the name of the solution that is used to treat people suffering from cholera?

### Resources

<http://www.nhs.uk/conditions/cholera/Pages/Definition.aspx>

<http://www.cdc.gov/cholera/index.html>

<http://www.youtube.com/watch?v=XZ-bTrRF-E0>

Library and/or text books

### Cholera in the news

<http://www.guardian.co.uk/global-development/video/2010/dec/16/haiti-cholera-water>

[http://www.cleveland.com/opinion/index.ssf/2013/08/the\\_united\\_nations\\_must\\_make\\_a.html](http://www.cleveland.com/opinion/index.ssf/2013/08/the_united_nations_must_make_a.html)

Name \_\_\_\_\_

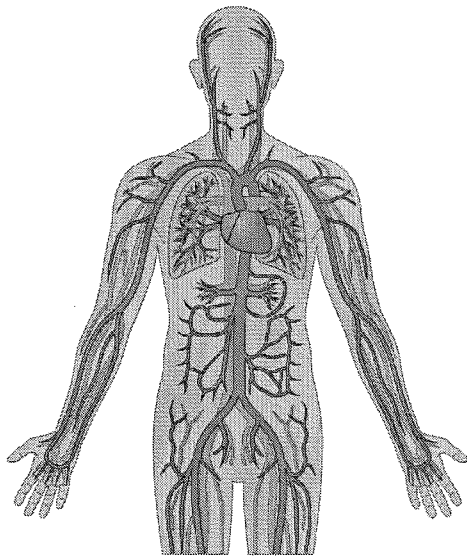


# Initial Assignment

Subject: Biology

The first topic we will study in Biology is the heart and circulatory system. Use the BBC Bitesize website for GCSE (PE) to help you refresh your knowledge from GCSE. Here's a link to help you.

[http://www.bbc.co.uk/schools/gcsebitesize/pe/appliedanatomy/0\\_anatomy\\_circulatorysys\\_rev1.shtml](http://www.bbc.co.uk/schools/gcsebitesize/pe/appliedanatomy/0_anatomy_circulatorysys_rev1.shtml)



The circulatory system (also known as the cardiovascular system) has 3 main components. What are they?

- 1)
- 2)
- 3)

Why is it known as a double circulatory system?

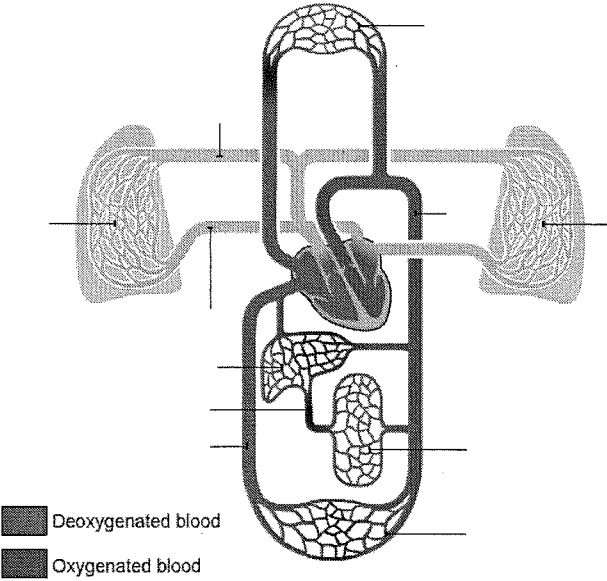
Use the words below to complete the information

Oxygen	Haemoglobin	Systemic	Pulmonary
Oxygenated	Nutrients	De-oxygenated	Carbon dioxide

Blood is carried to the lungs in the \_\_\_\_\_ circuit. The blood becomes \_\_\_\_\_ which means that oxygen enters red blood cells where it is taken up by \_\_\_\_\_. At the same time, \_\_\_\_\_ is removed from the blood and enters the lungs to be breathed out. The blood is then returned to the heart.

The blood is carried around the body in the \_\_\_\_\_ circuit. This delivers \_\_\_\_\_ and \_\_\_\_\_ to the cells of the body and returns \_\_\_\_\_ blood to the heart.

Watch the animation to show how blood flows through the pulmonary and systemic circulatory systems then label the diagram and add labels to show the route of blood through these systems.

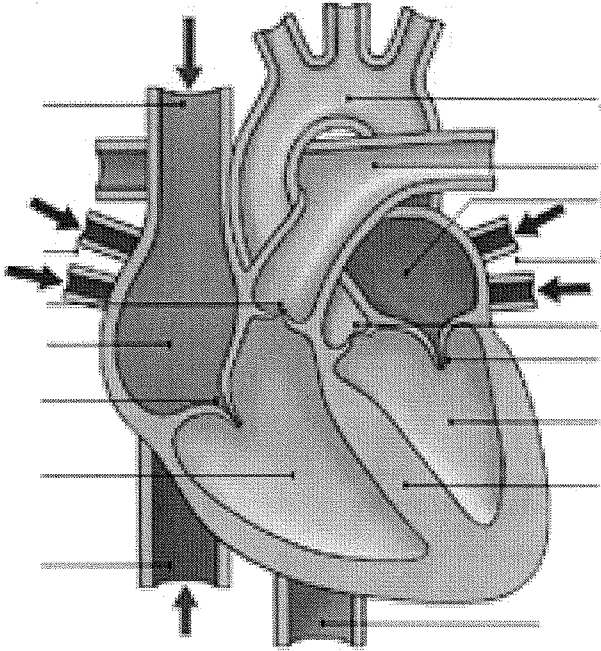


**Heart structure**

First write the words "Left" and "Right" in the boxes below to show which is the left side of the heart and which is the right side. Then label the rest of the diagram.

side

side

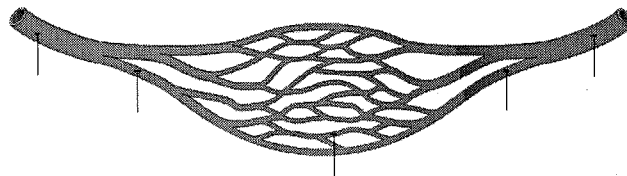


Now answer the questions on the heart on the next page

- 1) Which chamber of the heart does deoxygenated blood from the body enter?
- 2) Which chamber of the heart does oxygenated blood from the lungs enter?
- 3) When the atria contract, blood is pushed from the atria into the ventricles. Which valve does blood pass through on
  - a) the right side of the heart?
  - b) the left side of the heart?
- 4) When the ventricles contract, blood is pushed upwards and out of the heart. Which valves are pushed open to allow the blood to exit?
- 5) Where does deoxygenated blood from the right ventricle go when it leaves the heart?
- 6) Where does oxygenated blood from the left ventricle go when it leaves the heart?
- 7) What is the role of the septum?

### Blood vessels

This is a diagram of a capillary bed. Label the diagram and add an arrow to show the direction of blood flow through the capillary bed.



Now read the information about arteries, veins and capillaries and complete the table below to show which blood vessel each of the statements refers to.

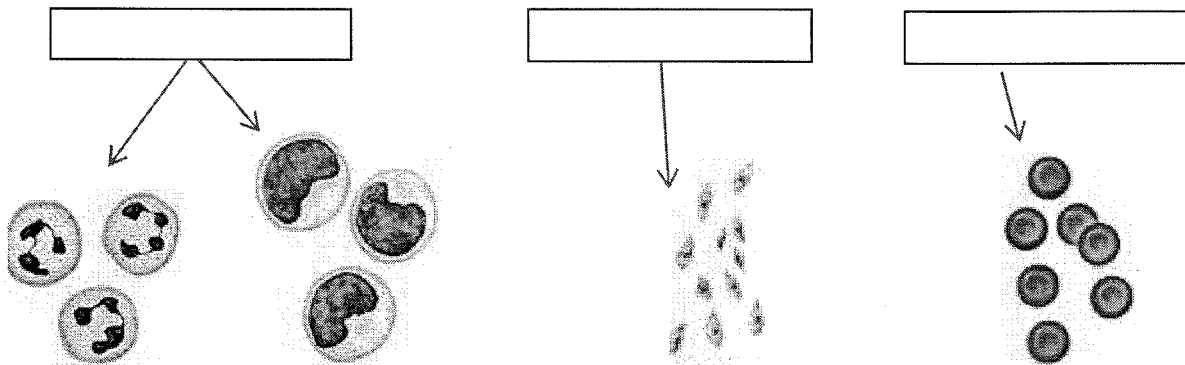
Feature of blood vessel	Type of blood vessel (Artery, vein or capillary)
Gas exchange takes place here	
Have thick muscular walls	
Carry blood to the heart	
Carry blood away from the heart	
Are one cell thick	
Have thick muscular walls	
Have thin walls	
Have large internal lumen	
Have small internal lumen	

## Blood

What are the 4 key components of the blood?

- 1)
- 2)
- 3)
- 4)

Put labels in the boxes below to identify some of the key components of the blood.



Now read the information about blood and complete the table below to show which component of the blood each of the statements refers to.

Feature	Component of the blood
Contains haemoglobin which carries oxygen	
Produce antibodies	
Made in the bone marrow – more are made when you exercise regularly	
Protect the body by helping to stop bleeding	
Destroys harmful microorganisms	
Liquid part of the blood	
Clump together during blood clotting	
Made in the bone marrow	
Carries carbon dioxide, hormones and waste products	