

Body Systems

Science Homework Booklet

Level 3/4

Name _____

Homework number	Due date	On time	Mark	Parental/Guardian signature
1			/10	
2			/10	
3			/8	
4			/10	

Glossary

<u>Word</u>	<u>Meaning</u>
Bacteria	A small organism that can only be seen through a microscope. Can cause disease.
Carbon dioxide	Gas that our body breathes out.
Cell	Small units that the body is made from.
Digestion	Break down of large, insoluble molecules into small, soluble molecules.
Disease	An illness.
Exhalation	Breathing out.
Homeostasis	The body keeping its internal conditions (such as temperature or blood sugar) at the same level.
Inhalation	Breathing in.
Microbe	Small living organisms that can only be seen through a microscope.
Oxygen	Gas that our body takes in from the air
Vaccine	An injection that protects against a particular disease.
Vasoconstriction	When the blood vessels narrow to lower heat loss through the skin.
Vasodilation	When the blood vessels widen to increase heat loss through the skin.
Virus	Tiny object that can cause disease when it enters a living organism.

S 1 S C I E N C E

B o d y S y s t e m s - H o m e w o r k 1

1 The table below shows some of the organs found in the human body. Complete the table by stating which body system each organ belongs to. One has been completed for you.

<i>Organ</i>	<i>System to which the organ belongs</i>
Heart	
Stomach	
Brain	NERVOUS SYSTEM
Lungs	
Intestines	

(2)

2 Draw a line to match the body system in the left hand column to its function in the right hand column.

BODY SYSTEM

FUNCTION

Circulatory system

Breaks down food

Respiratory system

Pumps blood around the body

Digestive system

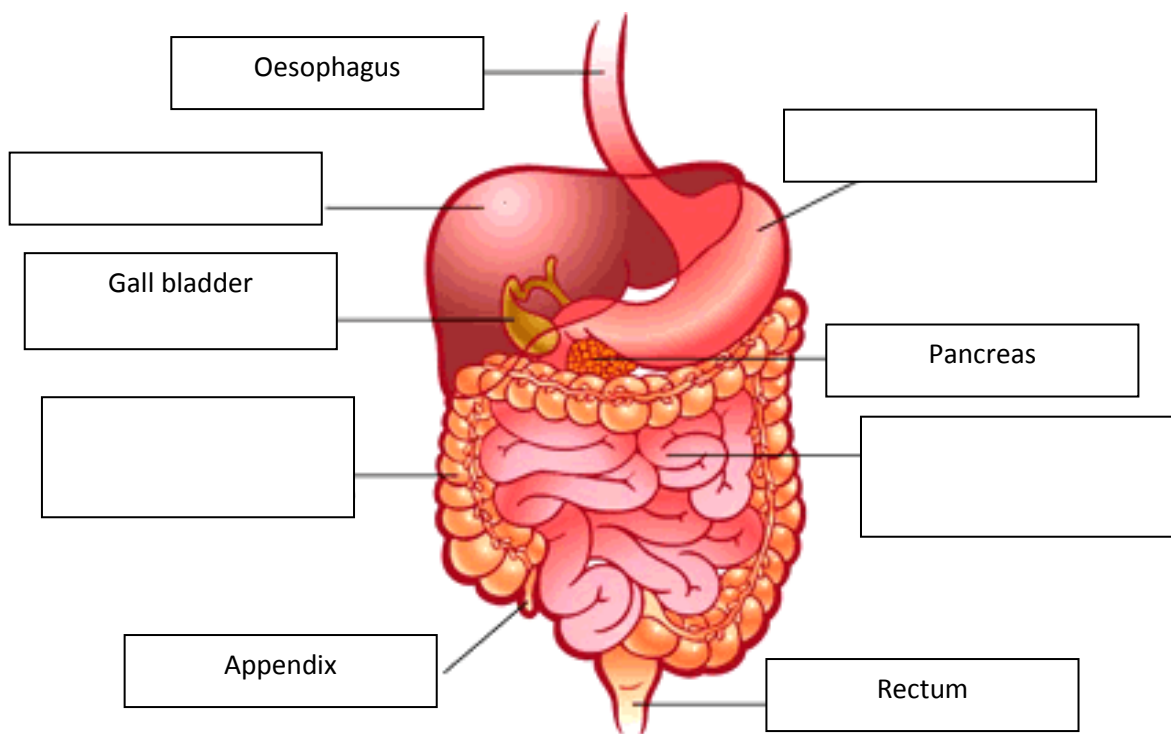
Moves oxygen from the air into the blood

(2)

3 Give a definition of the word "digestion".

(1)

4 The diagram below shows the digestive system. Complete the diagram by adding in the missing labels.

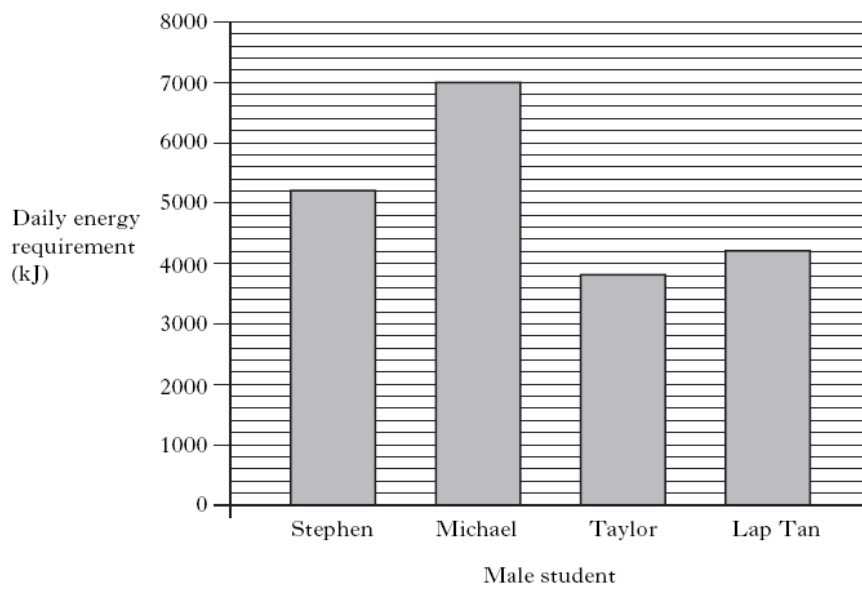


(2)

b State the function of the oesophagus.

(1)

5 The graph below shows the daily energy requirements of four male pupils.



Male pupil	Daily energy requirement (kJ)
Stephen	
Taylor	
	7000
Lap Tan	

Use the information in the graph to complete the table at the side.

(2)

S 1 S C I E N C E

B o d y S y s t e m s - H o m e w o r k 2

1 Explain the function of the ribs.

_____ (1)

2 Describe the movement of the muscles between the ribs and the diaphragm when we inhale.

_____ (2)

3 Name two substances that can be carried round the body in the blood.

_____ (1)

4 Decide if the following statements about the circulatory system are true or false.

Veins carry blood to the heart.

TRUE/FALSE

The heart has 3 chambers.

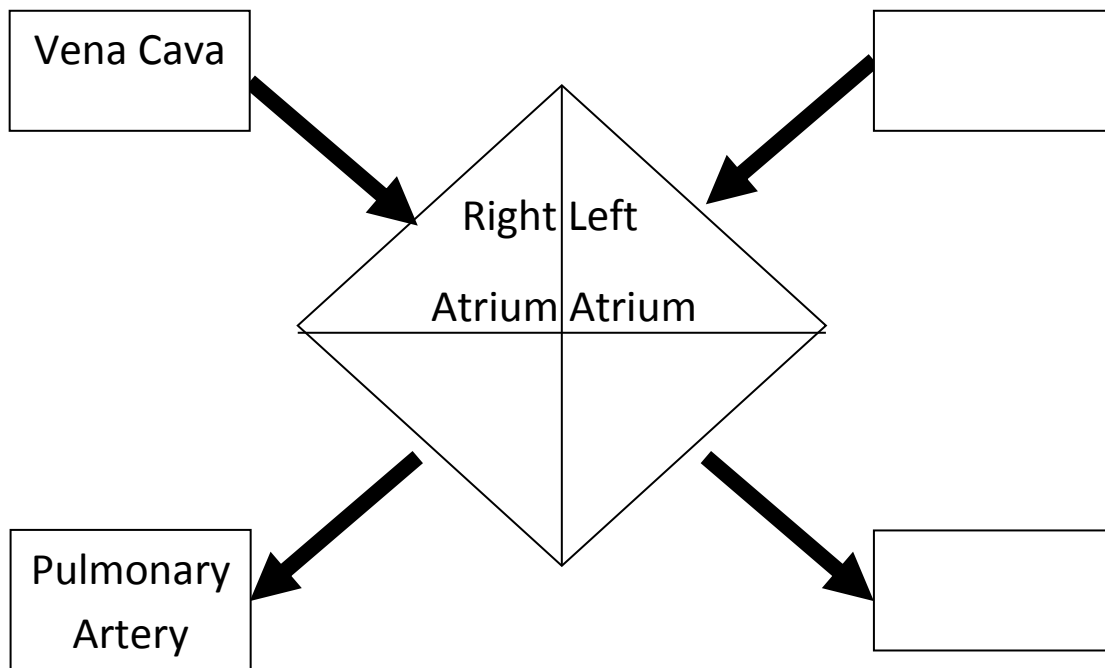
TRUE/FALSE

Eating a high salt diet lowers the risk of getting heart disease.

TRUE/FALSE

(2)

5 Complete the diagram below which shows the simplified structure of the heart.



(3)

6 Name two things that you should do to prevent heart disease.

(1)

S 1 S C I E N C E

B o d y S y s t e m s - H o m e w o r k 3

1 Which of the following instruments is used to measure blood pressure?

(Tick the correct box)

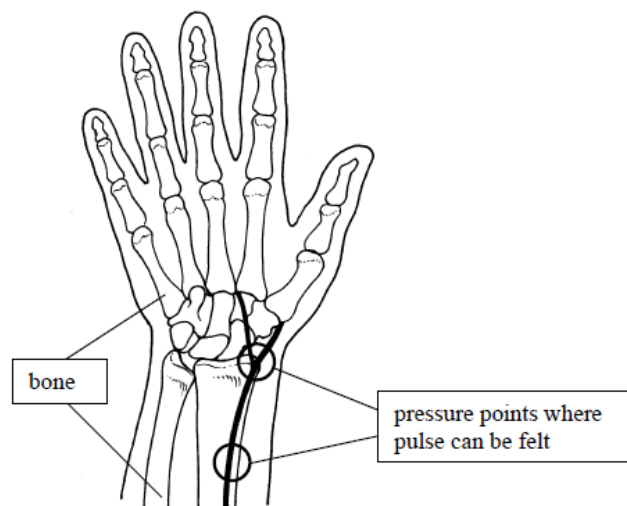
Sphygmomanometer ☐

Pulsometer ☐

Thermometer ☐

(1)

2 The diagram below represents an X-ray picture showing a right hand. Two areas on a blood vessel, where pulse can be measured, are indicated.



The list below shows the steps used to measure the pulse rate, but in the wrong order.

- 1 Count the number of beats in 10 seconds.
- 2 Place fingers over the pressure points on the wrist.
- 3 Repeat twice and find the average.
- 4 Multiply by six to calculate the beats per minute.

Arrange the steps in their correct order by writing the step numbers in the boxes below.

→ → →

(1)

- 3 Decide if each of the following statements about the effect of exercise is **TRUE** or **FALSE**, and tick the appropriate box.

If the answer is **FALSE**, write the correct word(s) in the **Correction** box to replace the word underlines in the statement.

Statement	True	False	Correction
Regular exercise <u>lowers</u> resting pulse rate.			
A fit person has a <u>longer</u> recovery time than an unfit person.			

(2)

- 4 A student, when at rest, measured her heart rate three times using a stethoscope and a stopwatch.



The results are shown in the table.

Measurement	Number of beats in 20 seconds
1	21
2	21
3	24

Calculate the student's:

- (i) Average heart rate in 20 seconds;
Space for calculation

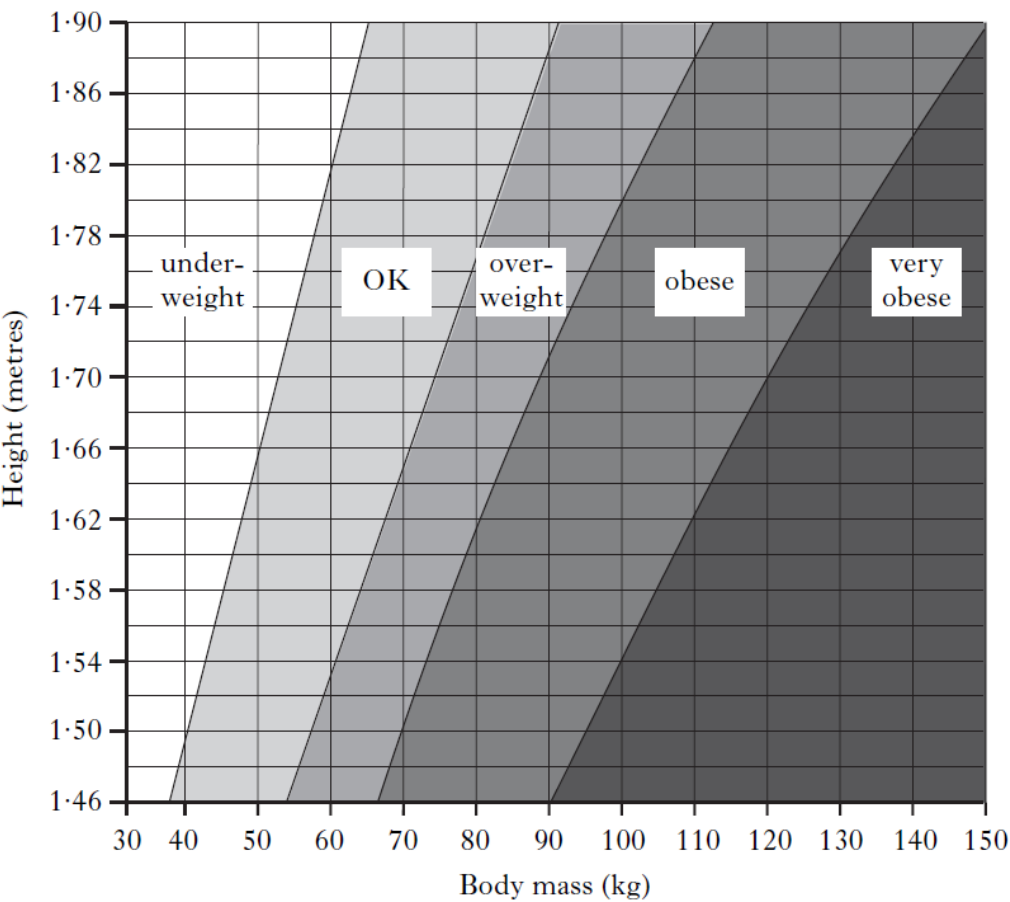
_____ beats per 20 seconds

(1)

(ii) Average pulse rate in beats per minute.
 Space for calculation

_____ beats per minute. (1)

5 The graph below shows the relationship between body mass and height for adults.



(i) Complete the following table using information in the graph.

<i>Person</i>	<i>Body mass (kg)</i>	<i>Height (metres)</i>	<i>Description</i>
X	100	1.62	Obese
Y	50	1.86	
Z	120	1.82	

(1)

- (ii) Complete the following sentence which relates to a person whose body mass is 100kg and is obese.

“The height of this person is between _____ metres and
_____ metres”.

(1)

S 1 S C I E N C E

B o d y S y s t e m s - H o m e w o r k 4

- 1 Name the part of the brain which detects changes in body temperature.

(1)

- 2 Draw lines to connect each mechanism to whether it would cool or heat up the body.

Mechanism

Shivering

Cools the body

Sweating

Heats up the body

Vasodilation

Body hairs stand on end

(2)

- 3 Diabetes is a condition in which the blood glucose level is not fully controlled by insulin. There are two types of diabetes. The table shows information about both types.

<i>Type 1 diabetes</i>	<i>Type 2 diabetes</i>
Insulin is not produced	Insulin is produced but is not used effectively
Usually starts at a young age	Often associated with being obese
Can be triggered by infection	Can be controlled with diet and exercise
Daily insulin injections	Medication can be given in tablet form

- a. A person with diabetes was treated using daily insulin injections. Using information from the table, state which type of diabetes this person had and why this treatment was required.

Type of diabetes _____ (1)

Why treatment was needed _____
_____ (1)

- b. Name the organ which makes insulin. _____ (1)

- 4 Vaccinations are given to protect people from diseases caused by micro-organisms. The following table gives information about some vaccines.

<i>Vaccine</i>	<i>Time vaccine is effective (years)</i>	<i>Booster vaccine required within effective period</i>	<i>Method of vaccination</i>
Hepatitis A	10	yes	injection
Hepatitis B	5	no	injection
Meningitis	5	no	injection
Polio	10	no	by mouth
Rabies	2	no	injection
Tetanus	10	no	injection
Typhoid	3	no	injection

a. Which vaccine is effective for the shortest time?

(1)

b. Which vaccine requires a booster to be given within the effective period?

(1)

c. Which vaccine is effective for 10 years, is given by injection and does not require a booster to be given?

(1)

d. List all the information from the table that is given about the meningitis vaccine.

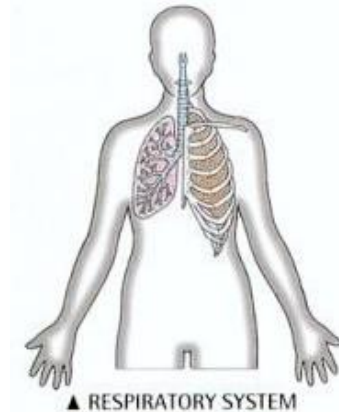
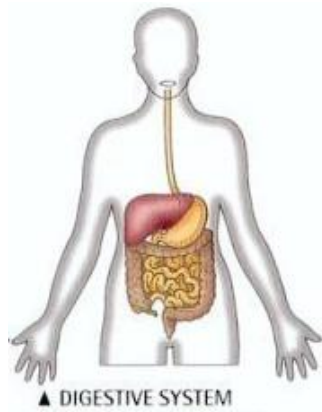
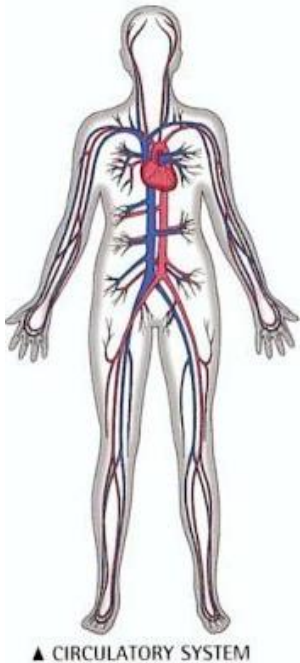
(1)

S1 Body Systems

Revision Notes

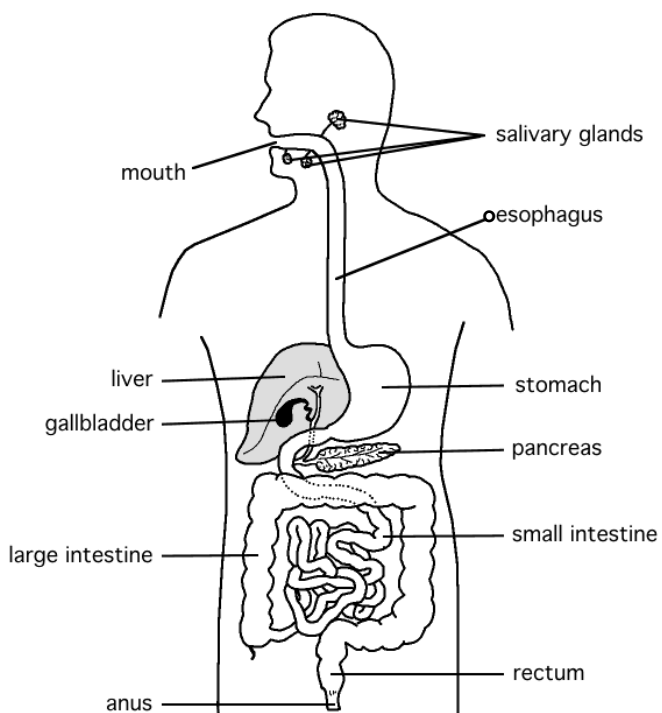
Body Systems

A body system is a group of organs that work together to carry out a particular function.



Digestive System

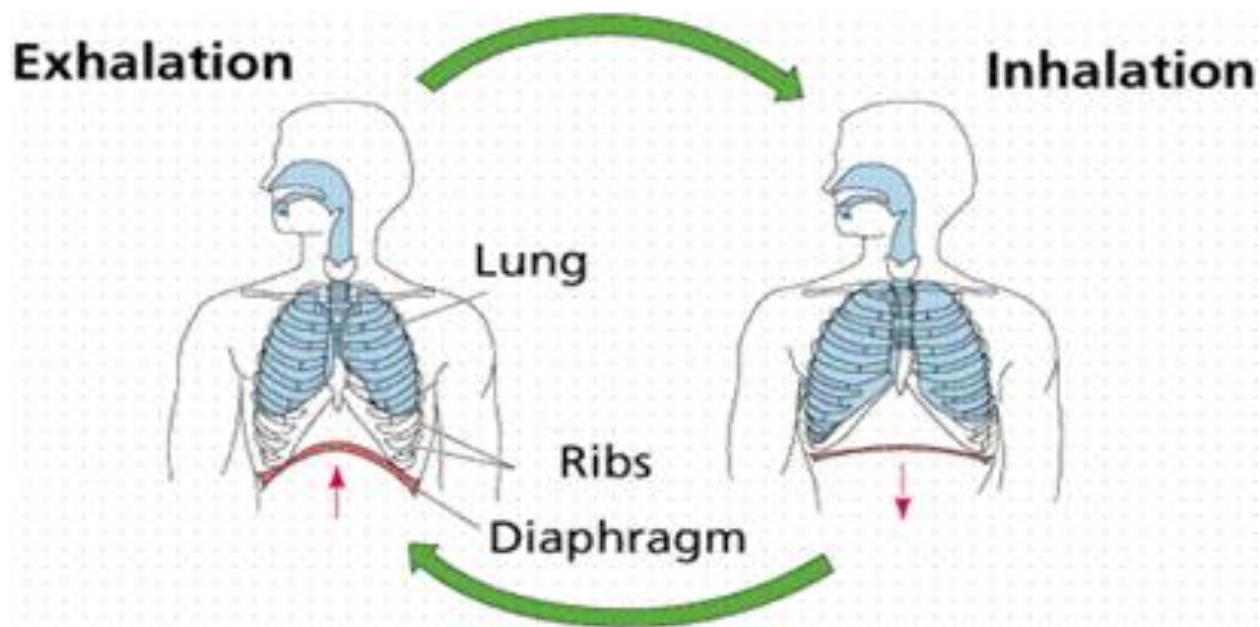
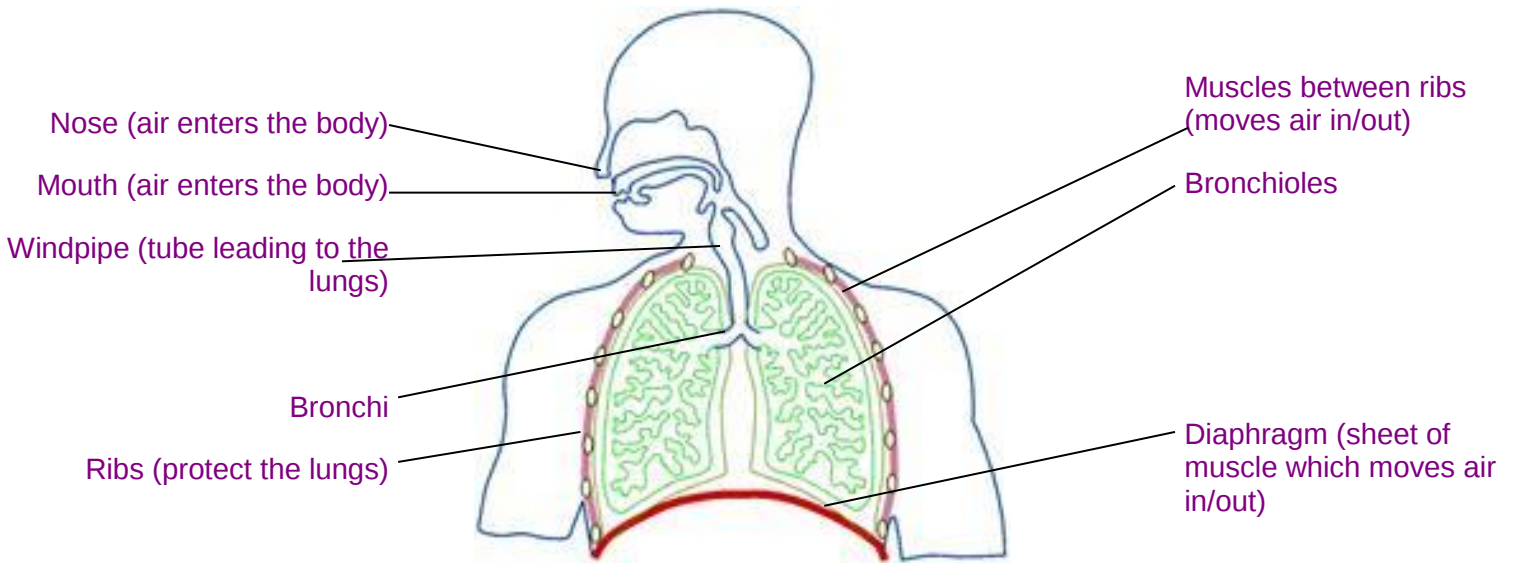
Digestion is the process of breaking down large, insoluble molecules of food into small, soluble molecules. The small molecules can then be absorbed into the blood.



<u>Part of Digestive System</u>	<u>Function</u>
Mouth	Teeth and enzymes start digestion of food
Oesophagus	Carries food to the stomach
Stomach	Churns food with acid and enzymes
Small intestine	Absorbs useful products of digestion
Large intestine	Absorbs water from waste to form faeces

Respiratory System

The main function of the respiratory system is to supply the blood with oxygen. The blood then delivers the oxygen to all parts of the body.



During exhalation

The rib-cage moves DOWN AND IN
Diaphragm moves UP

During inhalation

The rib-cage moves UP AND OUT
Diaphragm moves DOWN



Circulatory System

The heart is made of muscle and is divided into 4 chambers.

The main function of the circulatory system is to transport blood around the body. As the blood travels around the body it can deliver essential substances to cells (such as oxygen and dissolved food) and can remove waste products (such as carbon dioxide).

<i>Part of circulatory system</i>	<i>Function</i>
Heart	Pumps blood around the body
Arteries	Carry blood away from the heart
Veins	Carry blood to the heart

Measuring Health



PULSE RATE - pulse rate is the number of times your heart beats in a minute. It is measured with a stethoscope or a pulsometer



BLOOD PRESSURE - blood pressure is the pressure that your blood is pushed through your body at. It is measured using a sphygmomanometer. Blood pressure has 2 numbers in it; one number gives the pressure when the heart beats and the other number gives the pressure when the heart is at rest



RECOVERY RATE - recovery rate is the time it takes for your heart rate to return to normal after a period of exercise. The faster your recovery time, the fitter you are considered to be

Disease Screening

Screening is the process of identifying people who appear healthy but may be at increased risk of a disease. Some diseases that can be screened for are:

- Bowel cancer
- Macular degeneration and
- Diabetes.

Defence Against Disease

Diseases are caused by tiny organisms called microbes. Two types of disease-causing microbe are:

- BACTERIA
- VIRUSES

First line defence mechanisms prevent microbes from getting into the body.



Second line defence mechanisms start to work if the microbes get into the body. Second line defence is carried out by white blood cells. There are two types of white blood cells:

- "cell-eating" - these types of cells change shape to surround microbes, and then digest the microbes
- antibody producing - these types of cells make a y-shaped molecule called an antibody. Antibodies stick to microbes, stopping them from doing harm

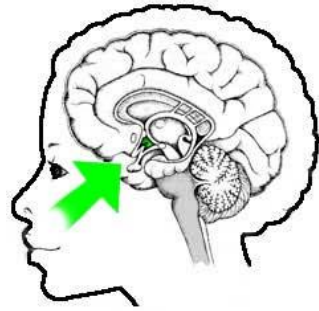
Another way to defend against disease is to get a vaccine. A vaccine is a disease-causing microbe that is either dead or inactive. Vaccines stimulate the body to produce antibodies (disease-fighting molecules) that give protection against a particular disease. Common vaccines include polio, MMR (measles, mumps, rubella) and chicken pox.

Homeostasis

Body cells work best if they have the correct

- Temperature
- Glucose (sugar) levels
- Water levels

Homeostasis is the control of the body to keep these conditions constant (the same).



The main temperature detecting centre is the hypothalamus (in the brain).

If our body temperature is too low we will start to:

- Shiver
- Vasoconstrict (blood supply to the skin lessens)
- Body hairs stand on end

If our body temperature is too high we will start to:

- Vasodilate (blood supply to the skin increases)
- Body hairs lie flat
- Sweat

Control of Blood Sugar

It is vital that the sugar or glucose level of the blood is kept constant.

Insulin and glucagon are the hormones that control the level of glucose in the blood.

Blood Glucose level too high?

- 1. **Insulin** produced by **pancreas**
- 2. **Insulin** travels to the liver in the bloodstream
- 3. **Glucose** changed into glycogen (and stored in the liver)
- 4. **Blood glucose lowered**

Blood Glucose level too low?

- 1. **Glucagon** produced by **pancreas**
- 2. **Glucagon** travels to the liver in the bloodstream
- 3. **Glycogen** changed into glucose
- 4. **Blood glucose rises**

