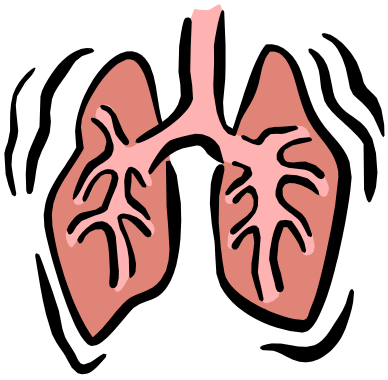
Notre Dame High School

First Year Science
Organ Systems

Activity Support Sheets



Name _____

Class ____

Breathing Organs

➔ Label the diagram using the words in the word list.

Word List:

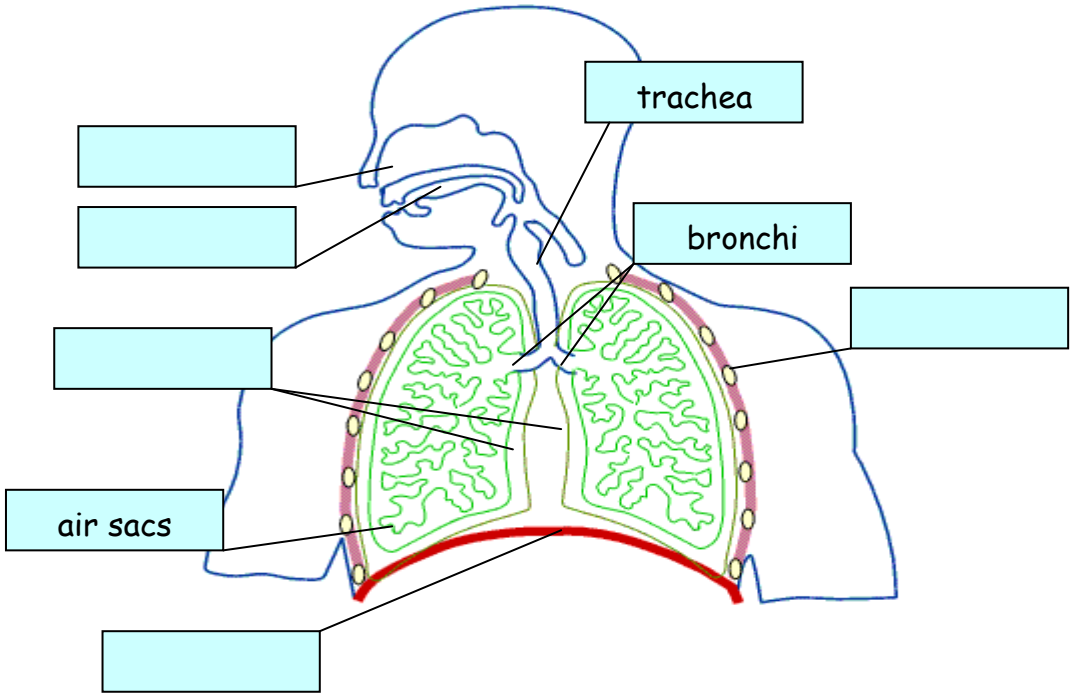
diaphragm

lungs

mouth

nose

ribcage



➔ Write a brief description of the breathing organs listed below.

- The trachea & bronchi

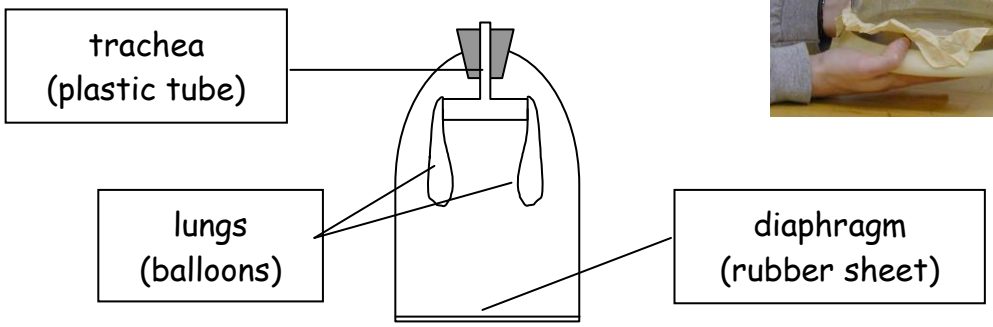
- The lungs

- The ribs

Word list: Airways, tubes, branches into two, spongy, air sacs (alveoli), pairs of bones, protection

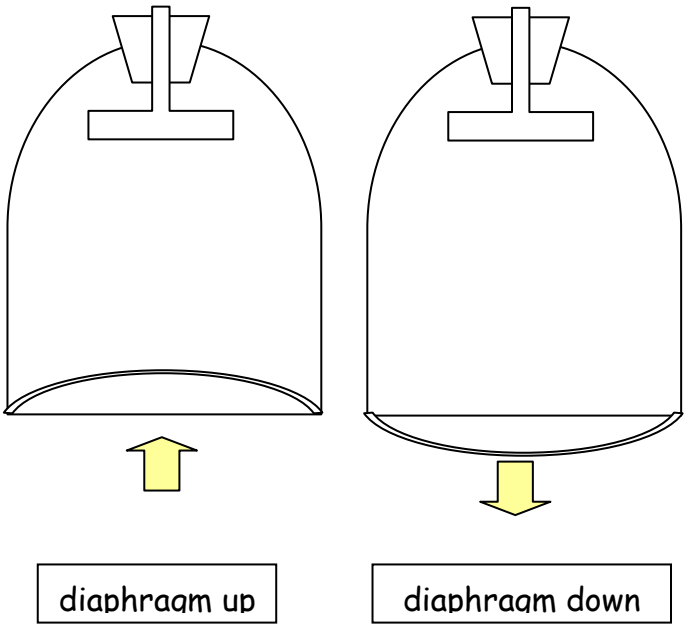
A Breathing Model

This model can be used to demonstrate the way in which the diaphragm muscle helps breathing.



Breathing in and out

Use the diaphragm on the model to inflate and deflate the balloons.



➔ Draw in the balloon "lungs" to show how they look when the diaphragm is up and when the diaphragm is down

➔ Describe how the diaphragm is used to inflate and deflate the lungs.

➔ Describe how our ribs help us breathe.

Monitoring Our Health

Health can be monitored using various types of instruments.

The health of our lungs is monitored using a:

Spirometer

This measures the maximum volume of air you can breathe _____

after one big _____.
A spirometer measures your

_____ capacity

Peak flow meter

This measures the _____

you can breathe out with.

Note down what the spirometer and peak flow meter is used to measure under each picture.

Practical Activity 1. Using the Spirometer

- Your teacher will demonstrate how to use the spirometer.

To use the spirometer:

1. Make sure the needle is at zero
2. Use a fresh mouth piece to blow into the spirometer, pushing out as much air as you can
3. Work with a partner and take 3 readings each.
4. Record your readings in a table and calculate the average value.

Practical Activity 2. Using the Peak flow meter

- Your teacher will demonstrate how to use the peak flow meter

To use the peak flow meter:

1. Make sure the needle is at zero
2. Use a fresh mouth piece to blow into the peak flow meter, pushing out as much air as you can
3. Work with a partner and take 3 readings each.
4. Record your readings in a table and calculate the average value.

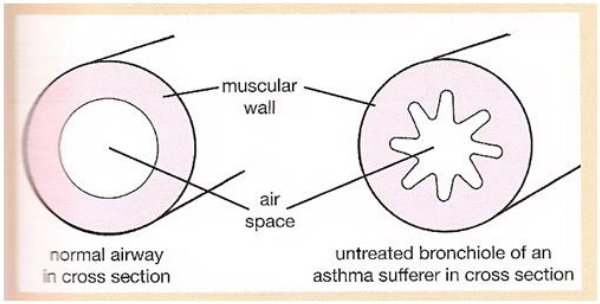
Instrument	First Reading	Second Reading	Third Reading	Average Reading
spirometer	(Litres/L)			
peak flow meter.	(L/min)			

Health Problems and breathing

Asthma

Asthma is a respiratory condition in which the **bronchioles** become **narrower** making breathing difficult and causing **wheezing**.
An asthmatic **cannot force air out of their lungs** as **easily** as a non-sufferer.

- Watch the video about asthma (https://www.youtube.com/watch?v=Et_alsghel8)



Before an asthma attack During an asthma attack

➔ Explain what has happened to cause this change in the bronchiole.

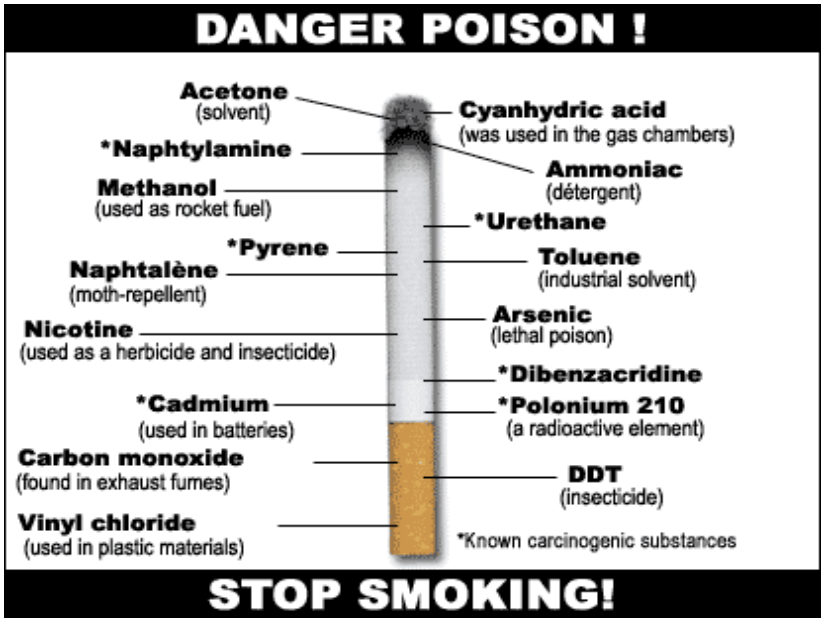
Medical Care of Asthma

A peak flow meter will help doctors work out if the airways are open enough to allow air to be forced out of the lungs

Unhealthy Lungs

Effects of Smoking on Lung Health

- Smoking is responsible for approximately **five million deaths** worldwide every year



Pupil Activity

Create an information leaflet that you could distribute to all of S1 to make them reconsider taking up smoking.

I am a scientist!

What effect does exercise have upon breathing rate?'

You are going to carry out an investigation into the changes that happen to our breathing.

➔Preparing for the investigation

What will we measure?

How will we measure it?

What needs to be kept the same?

What do you think will happen? (Prediction)

➔ Carrying out the investigation

How will we record our measurements?

What will be the headings for your table?

➔ Reporting and reviewing the investigation

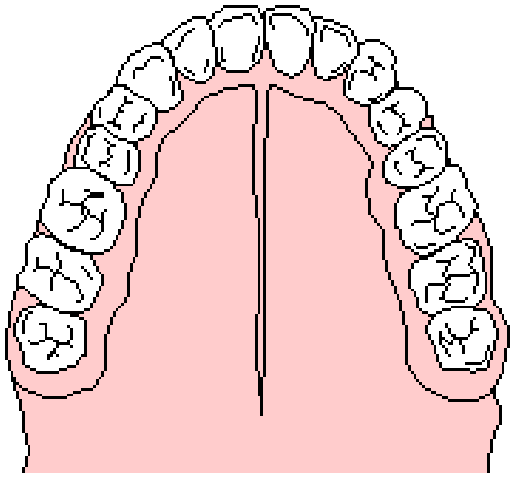
Make a graph of your results

Was your prediction correct?

What do the results tell you ~ what is your conclusion?

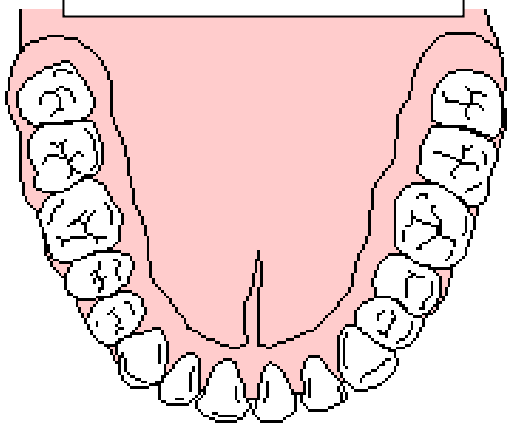
Toothless wonder? Or wonderful teeth?

➔ Put a cross on the mouth map to show where you have a missing or filled tooth.



Upper Jaw Teeth

Lower Jaw Teeth



➔ Complete the table below.

Tooth Type	Shape	Function
Incisor		
Canine		
Premolar		
Molar		

Get your Teeth into it

Find out which teeth you use to eat hard and soft food.

➔ Complete the table below for the different foods you ate.
(use the food checklist below to help you).

Name of food	Description	Incisor	Canine	Molar
Apple	e.g. Hard, Chewy			
Toffee				

Food Checklist

- Did I use my incisors to bite the food?
- Did I use my canine to tear or grip while I pulled with my hand?
- Did I use my molars to grind the food to pulp?

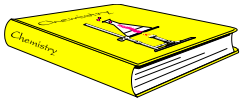
Finding out about digestion

This sheet will help you to plan how you are going to carry out your research, record your findings and present a report to your class.

1 Where are you going to find the information you need?

Write the names of the books, CD ROMs or web sites you use.

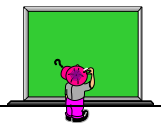
Your teacher may be able to help you with this.



2 What information are you going to need?

Write down any questions you want to find the answers to;

e.g. what does my small intestine do?



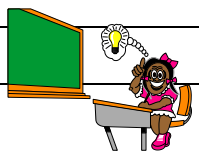
3 Now write down all of the information you have found.

Do this in your jotter or on a separate piece of paper.

4 How are you going to present your findings?

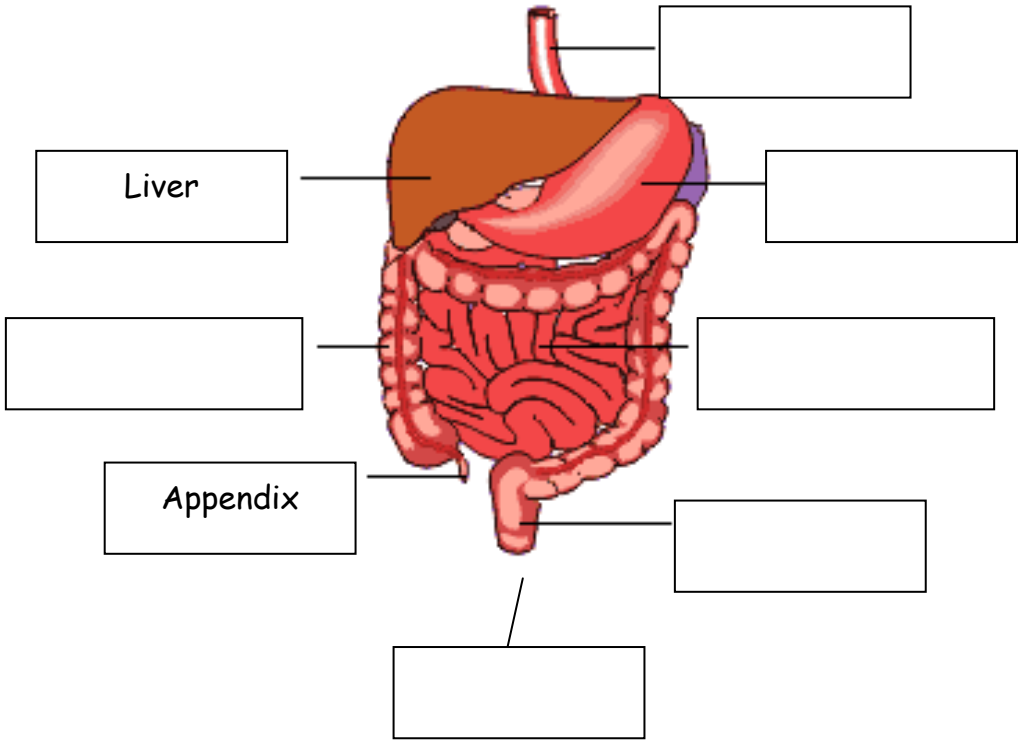
You could use a poster, a written report, or a report you read out to your class.

Be creative - what about a poem or a play?



Do you have the guts for it?

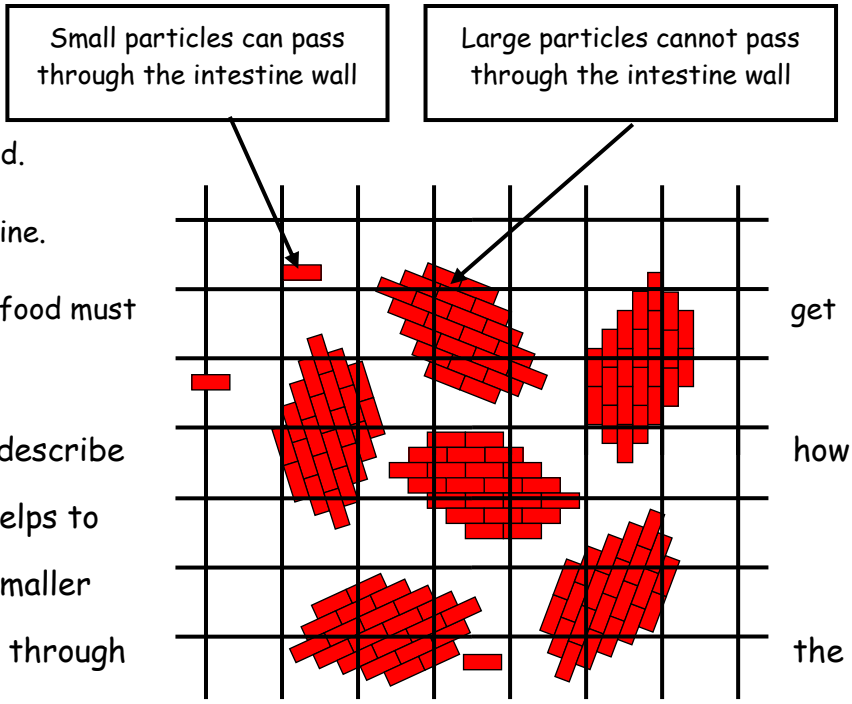
➔ Use the list of digestive organs below the diagram to fill in the boxes.



List of Digestive Organs

Anus	Rectum	Stomach	Large Intestine	Small intestine	Gullet (oesophagus)

Break down!



These toy bricks are like bits of food.

The net is like the wall of the intestine.

To get dissolved into the blood, the food must get through the intestine wall.

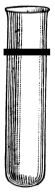
➔ Complete the table below, describe how each digestive organ helps to break down the food into smaller particles so that it can get through the intestine wall.

Organ	How it helps break down food
Mouth	
Gullet (oesophagus)	
Stomach	
Small intestine	
Large intestine	
Rectum	Stores solid waste
Anus	Allows waste to leave the body

Write a short note about how the body breaks down food.

Amylase and digestion

Set up the following test tubes and label these 1-4:

1	2	3	4
			
5 ml sugar Solution	5 ml Amylase solution	5 ml Starch suspension	5ml starch suspension + 5ml Amylase solution

1. Add a few ml of Benedict's reagent to test tube 1.
2. Sit the test tube in a boiling hot water bath and observe the colour change. This is the test for sugar.
3. Add 5ml of Benedict's reagent to the remaining test tubes and place these in the water bath for 5 minutes.

Test Tube	Results with Benedict's reagent.
1	
2	
3	
4	

Questions

1. Explain how to test for the presence of sugar.

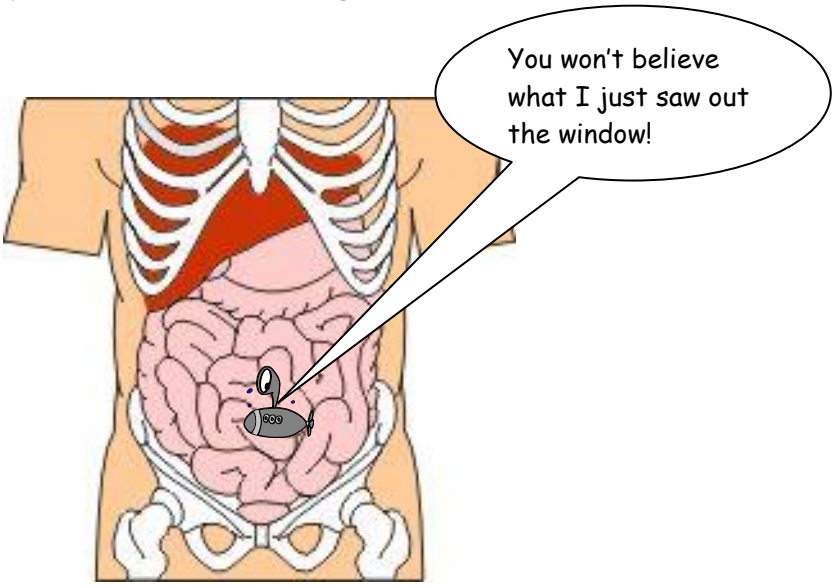
2. What does this experiment tell you about the action of amylase?

3. Why was it a good idea to test the contents of test tubes 1 and 2 with Benedict's reagent?

Where does it all go?

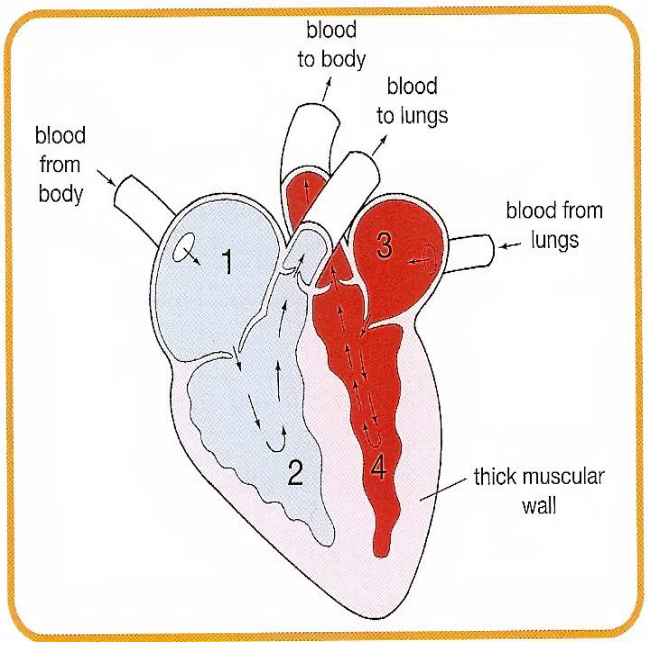
Imagine you were able to go into a submarine which got shrunk to the size of a peanut. Now imagine you were sent in your submarine to explore the digestive system of a person.

Write a story about your journey from the mouth to the anus. Mention the digestive organs you would meet and what you would see them doing to food.



Blood!

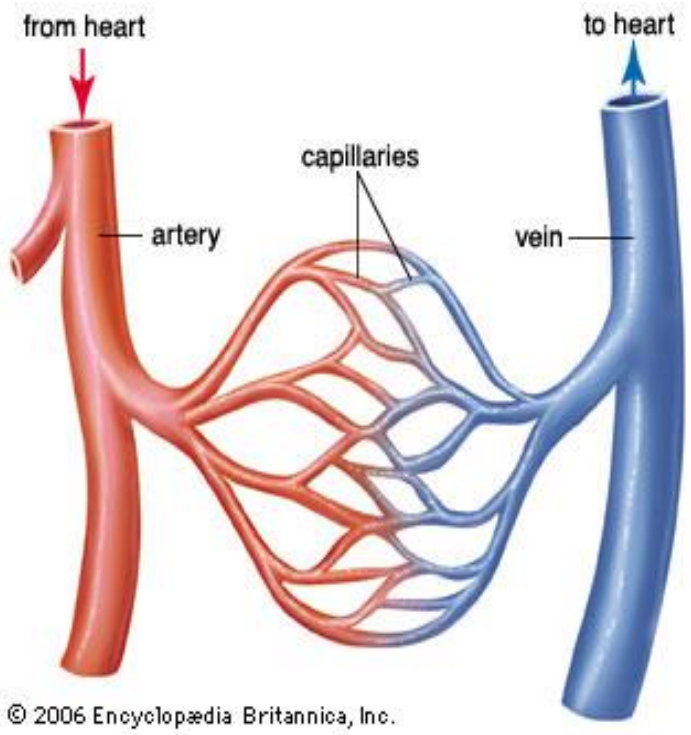
This is a diagram of a heart.



Complete the following sentences:

- The heart is made up of 4 _____
- Each valve _____ to allow blood to **pass in correct direction**
- Valves _____ to prevent the blood flowing _____ in the wrong direction

Blood Vessels



In the table below note down the three types of blood vessel and state the direction of blood flows.

Choose from:

- Away from the heart
- Towards the heart
- From artery to vein

Blood Vessel Name	Condition of the Blood in the Vessel

Blood Pressure

Today we are measuring your blood pressure. Blood pressure is the force of the blood pushing against the wall of your arteries. You feel it as your pulse.

To measure your blood pressure you need a digital sphygmomanometer.

Sit comfortably and wrap the cuff around your left arm as seen in this picture. Be careful not to wrap it too tight as the cuff is going to inflate.

Switch on the machine and wait for it to inflate and give a reading before removing it. If at any point to feels too tight let your teacher know and they can reset it for you.

Note your result below.

My blood pressure reading is…… / mmHg

Screening for Health Problems

Screening is a way of identifying apparently healthy people who may have an increased risk of a particular condition.

Health Conditions that are screened for include:

- Bowel cancer
- Macular degeneration
- Diabetes
- Iron deficiency anaemia

Pupil Activity

Research a health condition that is screened for.

Find out, for example:

1. What causes the condition?
2. What are the symptoms of the condition?
3. What is involved in screening for the condition?

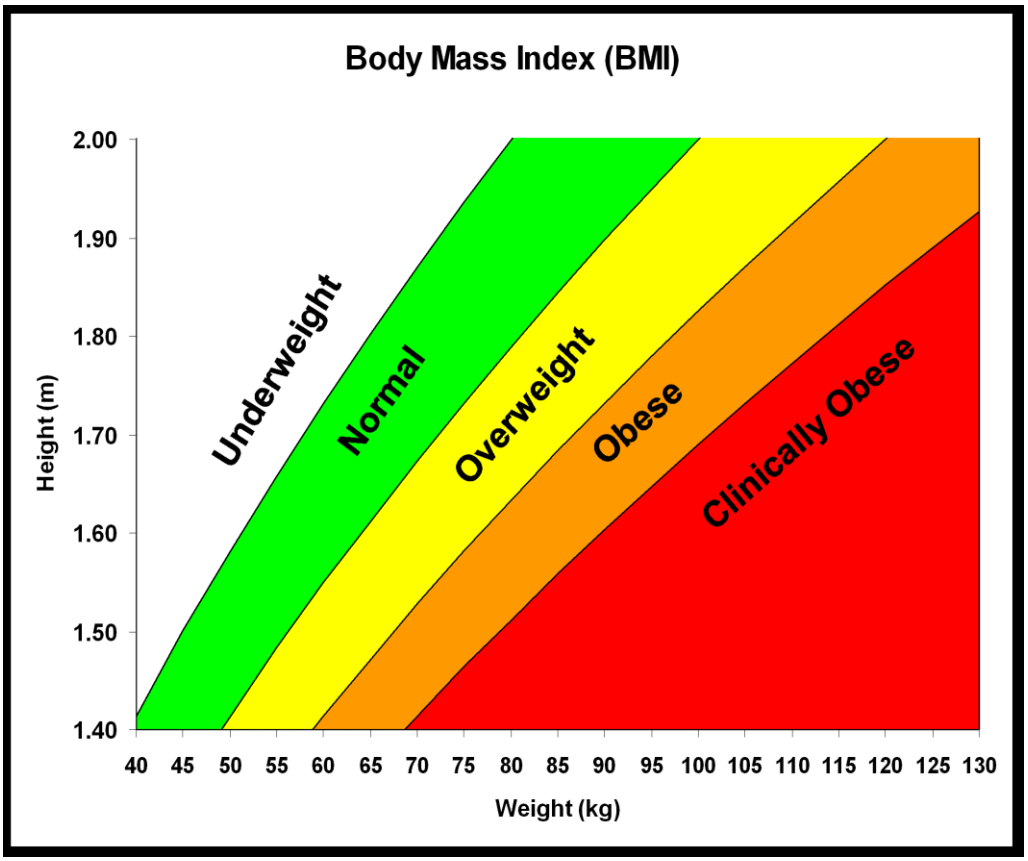
BMI and Health

- BMI stands for 'Body Mass Index'
- It is a measure for human body shape based on an individual's weight and height

- Body mass index is defined as the individual's body mass divided by the square of their height

$$BMI = \frac{\text{Mass (kg)}}{\text{Height(m)}^2}$$

Medical professionals will often use a BMI chart to see if a person is underweight or overweight



Underweight - BMI less than 18.5

Normal - BMI 18.5-25

Overweight - BMI 25-30

Obese - BMI 30-40

Clinically obese - BMI greater than 40

Who has a weight problem?

Use the information below to complete the table and calculate the BMI of these characters

Homer Simpson

Height: 1.78m
Mass: 110Kg

Lenny

Height: 1.80m
Mass: 70kg

Moleman

Height: 1.54m
Mass: 55Kg

McBain

Height: 1.89m
Mass: 109Kg

Comic Book Guy

Height: 1.83m
Mass: 140Kg

Mr Burns

Height: 1.70m
Mass: 50Kg

Name	Mass (kg)	Height (m)	Height^2 (m^2)	BMI
Comic Book Guy				
Homer Simpson				
Lenny				
McBain				
Moleman				
Mr. Burns				

BMI and Health

Questions

1. If a person's BMI is below 17.5, a person may have Anorexia. What harmful effects might anorexia have on a person's health?

2. If a person's BMI is above 30, a person is classified as obese. What harmful effects might obesity have on a person's health?

3. If you have a 'normal' BMI, do you need to worry about your health? Why/why not?