

# AQA Biology GCSE - Student Progress Sheet

Name:

Target:

## Unit 4.2 – Organisation

### 4.2.1. Principles of Organisation



a	I know that cells are the basic building blocks of all living organisms.			
b	I know that a tissue is a group of cells with a similar structure and function.			
c	I know that organs are aggregations (collections) of different tissues working together to perform specific functions.			
d	I know that organs are organised into organ systems, which work together to form organisms.			

### 4.2.2. Animal Tissues, Organs and Organ Systems

#### 4.2.2.1. The Human Digestive System

a	I know that the digestive system is an example of an organ system in which several organs work together to digest and absorb food.			
b	I can describe the structure and function of the parts of the human digestive system (from KS3).			
c	I know that digestive enzymes convert food into small soluble molecules that can be absorbed into the bloodstream.			
d	I can recall the sites of production and the action of amylase (a carbohydrase that breaks down starch), proteases (breakdown proteins into amino acids) and lipases (breakdown fats into glycerol and fatty acids).			
e	I know that bile is made in the liver and stored in the gall bladder and that it is alkaline to neutralise hydrochloric acid from the stomach. It also emulsifies fat to form small droplets which increases the surface area. The alkaline conditions and large surface area increase the rate of fat breakdown by lipase.			
f	I know that the products of digestion are used to build new carbohydrates, lipids and proteins and that some glucose is used in respiration.			
g	I know that enzymes are biological catalysts and that they control the rate of chemical reactions within the body (metabolism).			
h	I can use the lock and key model to describe how enzymes work (including the specificity of the active site).			
i	I can explain how temperature and pH changes affect the activity of enzymes.			
j	I can describe the iodine test for starch.			
k	I can describe the Benedict's test for sugars.			
l	I can describe the Biuret test for protein.			



#### 4.2.2.2. The Heart and Blood Vessels

a	I know that the heart is an organ that pumps blood around the body in a double circulatory system. The right ventricle pumps blood to the lungs (where gas exchange takes place). The left ventricle pumps blood around the rest of the body.			
b	I can name and locate the main blood vessels associated with the heart: aorta, vena cava, pulmonary artery, pulmonary vein and coronary arteries.			
c	I know that the body contains three different types of blood vessel: arteries, veins, capillaries.			
d	I can explain how the structure of arteries, veins and capillaries relate to their function.			
e	I can name and locate the following parts of the lungs: trachea, bronchi, alveoli and the capillary network surrounding the alveoli.			
f	I can explain how the lungs are adapted for gaseous exchange.			
g	I know that the natural resting heart rate is controlled by a group of cells located in the right atrium that act as a pacemaker and that artificial pacemakers are electrical devices used to correct irregularities in the heart rate.			

#### 4.2.2.3. Blood

a	I know that blood is a tissue consisting of plasma, in which the red blood cells, white blood cells and platelets are suspended.			
b	I know that the function of red blood cells is to transport oxygen from the lungs to the cells of the body.			
c	I know that the function of white blood cells is to defend the body against invading microorganisms.			
d	I know that the function of the platelets is to form scabs and prevent blood loss.			
e	I can identify red blood cells, white blood cells and platelets and explain how they are adapted to their functions.			

#### 4.2.2.4. Coronary Heart Disease: a non-communicable disease

a	I know that in coronary heart disease layers of fatty material build up inside the coronary arteries, narrowing them. This reduces the flow of blood through the coronary arteries, resulting in a lack of oxygen for the heart muscle.			
b	I can describe how stents are used to keep the coronary arteries open and discuss the advantages and disadvantages of this method of treatment.			
c	I can describe how statins are widely used to reduce blood cholesterol levels, which slows down the rate of fatty material deposit and I can discuss the advantages and disadvantages of this method of treatment.			
d	I know that in some people heart valves may become faulty, preventing the valve from opening fully, or the heart valve might develop a leak and I can describe the consequences of this on a person's health.			
e	I can describe how faulty heart valves can be replaced using biological or mechanical valves and I can discuss the advantages and disadvantages of these methods of treatment.			
f	I know that in the case of heart failure, a donor heart, or heart and lungs can be transplanted and I can discuss the advantages and disadvantages of this method of treatment.			
g	I know that artificial hearts are occasionally used to keep patients alive whilst waiting for a heart transplant, or to allow the heart to rest as an aid to recovery.			



#### 4.2.2.5. Health Issues

a	I know that health is the state of physical and mental well-being.			
b	I know that diseases, both communicable and non-communicable, are major causes of ill health.			
c	I can describe how other factors, such as diet, stress and life situations may have a profound effect on both physical and mental health.			
d	I can explain how different types of disease may interact, including: <ul style="list-style-type: none"> <li>• defects in the immune system mean that an individual is more likely to suffer from infectious diseases;</li> <li>• viruses living in cells can be the trigger for cancers;</li> <li>• immune reactions initially caused by a pathogen can trigger allergies such as skin rashes and asthma;</li> <li>• severe physical ill health can lead to depression and other mental illness.</li> </ul>			

#### 4.2.2.6. The Effect of Lifestyle on Some Non-communicable Diseases

a	I can describe some risk factors that are linked to an increased rate of a disease, such as: <ul style="list-style-type: none"> <li>• aspects of a person's lifestyle e.g. diet, physical activity;</li> <li>• substances in the person's body or environment e.g. drugs, ionising radiation.</li> </ul>			
b	I know that a causal mechanism has been proven for some risk factors, such as: <ul style="list-style-type: none"> <li>• the effects of diet, smoking and exercise on cardiovascular disease;</li> <li>• obesity as a risk factor for Type 2 diabetes;</li> <li>• the effect of alcohol on the liver and brain function;</li> <li>• the effect of smoking on lung disease and lung cancer;</li> <li>• the effects of smoking and alcohol on unborn babies;</li> <li>• carcinogens, including ionising radiation, as risk factors in cancer.</li> </ul>			
c	I know that many diseases are caused by the interaction of a number of factors..			

#### 4.2.2.7. Cancer

a	I know that cancer develops as a result of changes in cells that lead to uncontrolled growth and division.			
b	I know that benign tumours are growths of abnormal cells which are contained in one area, usually within a membrane. They do not invade other parts of the body.			
c	I know that malignant tumour cells are cancers. They invade neighbouring tissues and spread to different parts of the body (via the bloodstream) where they form secondary tumours.			

#### 4.2.3. Plant Tissues, Organs and Systems

##### 4.2.3.1. Plant Tissues

a	I know that the leaf is a plant organ and I can name and locate: the epidermis, the palisade layer, the spongy mesophyll, the xylem and phloem, and the guard cells surrounding stomata.			
b	I can describe the structure of epidermal tissue and explain how it is related to its function.			
c	I can describe the structure of palisade mesophyll tissue and explain how it is related to its function.			
d	I can describe the structure of spongy mesophyll tissue and explain how it is related to its function.			
e	I can describe the structure of xylem and phloem tissue and explain how it is related to its function.			
f	I know that meristem tissue is found at the growing tips of shoots and roots.			



### 4.2.3.2. Plant Organ System

a	I know that the roots, stem and leaves form a plant organ system for transport of substances around the plant.			
b	I can describe how root hair cells are adapted for the efficient uptake of water by osmosis, and mineral ions by active transport.			
c	I know that xylem tissue is composed of hollow tubes strengthened by lignin and that it transports water and mineral ions from the roots to the stems and leaves and that this process is called transpiration.			
d	I know that phloem tissue is composed of tubes of elongated cells and that cell sap can move from one phloem cell to the next through pores in the end walls.			
e	I know that phloem tissue transports dissolved sugars from the leaves to the rest of the plant for immediate use or storage and that the movement of food molecules through phloem tissue is called translocation.			
f	I can describe the structure and function of the stomata, including how stomata and guard cells control gas exchange and water loss.			
g	I can describe the processes of transpiration and translocation.			
h	I can explain the effect of changing temperature, humidity, air movement and light intensity on the rate of transpiration.			