

Animal tissues, organs and organ systems

What is the digestive system an example of?

Animal tissues, organs and organ systems

What do digestive enzymes do?

Animal tissues, organs and organ systems

Why does an enzyme catalyse only one type of reaction?

Animal tissues, organs and organ systems

Describe the lock and key theory.

Animal tissues, organs and organ systems

What does it mean when an enzyme is denatured?

Animal tissues, organs and organ systems

How does temperature affect enzyme activity?

Animal tissues, organs and organ systems

How does pH affect enzyme activity?

Animal tissues, organs and organ systems

How do you calculate the rate of a reaction?

Convert food into small soluble molecules that can be absorbed into the bloodstream.

An organ system in which several organs work together to digest and absorb food.

The substrate fits the enzyme's active site like a key fits a lock, because their shapes are complementary. It is a simplified model.

Because of the shape of its active site, which only fits a specific substrate.

Rate rises with temperature up to the optimum, then falls quickly as the enzyme denatures.

The shape of its active site has changed, so the substrate no longer fits. It happens at high temperature or extreme pH.

Rate = amount of product formed $\div$ time. If the end point is a colour change, rate = $1 \div$ time taken.

Each enzyme has an optimum pH. Away from the optimum the active site changes shape and the enzyme is denatured.

Animal tissues, organs and organ systems

Amylase: what does it break down and where is it made?

Animal tissues, organs and organ systems

Protease: what does it break down and where is it made?

Animal tissues, organs and organ systems

Lipase: what does it break down and where is it made?

Animal tissues, organs and organ systems

What are the products of digestion used for?

Animal tissues, organs and organ systems

Where is bile made and stored, and what does it do?

Animal tissues, organs and organ systems

Why does emulsifying fat speed up digestion?

Animal tissues, organs and organ systems

Benedict's test: what is it for and what is the positive result?

Animal tissues, organs and organ systems

Iodine test: what is it for and what is the positive result?

Breaks proteins into amino acids. Made in the stomach, pancreas and small intestine.

A carbohydrase that breaks starch into simple sugars. Made in the salivary glands, pancreas and small intestine.

To build new carbohydrates, lipids and proteins. Some glucose is used in respiration.

Breaks lipids (fats) into glycerol and fatty acids. Made in the pancreas and small intestine.

It breaks fat into small droplets, which have a larger surface area for lipase to act on, so fat is broken down faster.

Made in the liver and stored in the gall bladder. It is alkaline, so it neutralises stomach acid, and it emulsifies fat into small droplets, increasing the surface area.

Tests for starch. Orange-brown changes to blue-black.

Tests for sugars. Heat with Benedict's solution. Blue changes to green, yellow, orange or brick-red.

Animal tissues, organs and organ systems

Biuret test: what is it for and what is the positive result?

Animal tissues, organs and organ systems

How do you test for lipids?

Animal tissues, organs and organ systems

Amylase and pH practical: how do you tell when all the starch is digested?

Animal tissues, organs and organ systems

What is a double circulatory system?

Animal tissues, organs and organ systems

What does each ventricle pump blood to?

Animal tissues, organs and organ systems

Which vessels carry blood to and from the lungs?

Animal tissues, organs and organ systems

Which vessels carry blood to and from the body?

Animal tissues, organs and organ systems

What do the coronary arteries do?

Add Sudan III stain and shake: a red-stained oily layer forms on top. (Alternative: ethanol emulsion test gives a cloudy white emulsion.)

Tests for protein. Blue changes to purple (lilac).

Blood passes through the heart twice per circuit: once to the lungs and once around the rest of the body.

Test samples with iodine every 30 seconds. When the iodine stays orange-brown there is no starch left.

The pulmonary artery carries blood from the heart to the lungs. The pulmonary vein carries blood back from the lungs.

Right ventricle: to the lungs, where gas exchange takes place. Left ventricle: around the rest of the body.

They supply the heart muscle with oxygenated blood.

The aorta carries oxygenated blood from the left ventricle. The vena cava brings blood back to the right atrium.

Animal tissues, organs and organ systems

How are the alveoli adapted for gas exchange?

Animal tissues, organs and organ systems

What route does air take to reach the blood in the lungs?

Animal tissues, organs and organ systems

What controls the natural resting heart rate?

Animal tissues, organs and organ systems

How is an artery adapted to its function?

Animal tissues, organs and organ systems

How is a vein adapted to its function?

Animal tissues, organs and organ systems

How is a capillary adapted to its function?

Animal tissues, organs and organ systems

What is the equation for rate of blood flow?

Animal tissues, organs and organ systems

What is blood made of?

Trachea, then bronchi, then alveoli. Oxygen diffuses from the alveoli into the capillary network surrounding them.

Large surface area, thin walls, a good blood supply from the capillary network, and ventilation, which keeps a steep concentration gradient.

Carries blood at high pressure away from the heart. Thick walls with muscle and elastic fibres, and a narrow lumen.

A group of cells in the right atrium that act as a pacemaker. Artificial pacemakers are electrical devices that correct irregular heart rate.

Exchanges substances with cells. Walls are one cell thick, giving a short diffusion distance, and are permeable.

Carries blood at low pressure to the heart. Thinner walls, a wide lumen and valves to prevent backflow.

A tissue of plasma, in which red blood cells, white blood cells and platelets are suspended.

Rate of blood flow = volume of blood $\div$ time
(for example cm³/min).

Animal tissues, organs and organ systems

What does plasma transport?

Animal tissues, organs and organ systems

What is the function of red blood cells and how are they adapted?

Animal tissues, organs and organ systems

What do white blood cells do?

Animal tissues, organs and organ systems

What are platelets and what do they do?

Animal tissues, organs and organ systems

How can you tell a red blood cell from a white blood cell in a photograph?

Animal tissues, organs and organ systems

What happens in coronary heart disease?

Animal tissues, organs and organ systems

What is a stent?

Animal tissues, organs and organ systems

What do statins do?

Carry oxygen using haemoglobin.
Biconcave shape gives a large surface area,
and no nucleus leaves room for
haemoglobin.

Carbon dioxide, soluble products of
digestion, urea and hormones.

Small fragments of cells with no nucleus.
They help the blood to clot at a wound.

Defend the body against pathogens, for
example by engulfing them or producing
antibodies and antitoxins.

Layers of fatty material build up inside the
coronary arteries, narrowing them. Less
blood flows, so the heart muscle gets less
oxygen.

Red blood cells are small, round and have
no nucleus. White blood cells are larger
with a visible nucleus.

Reduce blood cholesterol levels, which
slows down the rate of fatty material
deposit.

A device used to keep the coronary arteries
open.

Animal tissues, organs and organ systems

What can go wrong with a heart valve, and how can it be treated?

Animal tissues, organs and organ systems

What treatments are used for heart failure?

Animal tissues, organs and organ systems

What is health?

Animal tissues, organs and organ systems

Give two ways different types of disease can interact.

Animal tissues, organs and organ systems

Why should a study of disease or risk factors use a large, representative sample?

Animal tissues, organs and organ systems

What is a risk factor?

Animal tissues, organs and organ systems

What is a causal mechanism?

Animal tissues, organs and organ systems

Which disease is obesity a risk factor for?

A donor heart, or heart and lungs, can be transplanted. Artificial hearts keep patients alive while waiting, or let the heart rest.

It may not open fully, so less blood flows through, or it may leak, so blood flows backwards. Faulty valves can be replaced with biological or mechanical valves.

Immune system defects make infections more likely. Viruses can trigger cancers. Immune reactions to a pathogen can trigger allergies. Severe physical illness can lead to depression.

The state of physical and mental well-being. Disease, diet, stress and life situations can all affect health.

Something linked to an increased rate of a disease, such as an aspect of lifestyle or a substance in the body or environment.

Not everyone can be tested. A large sample that represents the population gives more reliable data and conclusions.

Type 2 diabetes.

An explanation of how a risk factor causes a disease. It has been proven for some risk factors but not others.

Animal tissues, organs and organ systems

What are the effects of alcohol and smoking on unborn babies?

Animal tissues, organs and organ systems

How does smoking affect health?

Animal tissues, organs and organ systems

What is a carcinogen?

Animal tissues, organs and organ systems

What costs do non-communicable diseases have?

Animal tissues, organs and organ systems

What is cancer?

Animal tissues, organs and organ systems

Benign tumour or malignant tumour: which is cancer, and how do they differ?

It raises the risk of cardiovascular disease, lung disease and lung cancer.

Smoking can cause low birth weight and premature birth. Alcohol can damage the baby's development, including the brain.

Human costs (suffering, early death) and financial costs (treatment, lost work), for individuals, communities, nations and globally.

A substance or radiation that can cause cancer. Ionising radiation is one example.

Malignant tumours are cancers: they invade neighbouring tissues and spread in the blood to form secondary tumours. Benign tumours stay in one area, usually within a membrane.

The result of changes in cells that lead to uncontrolled growth and division.