Questions

Proteins -

1. What is the primary structure of a protein?
2. What type of bond holds together the secondary structure of a protein?

Carbohydrates

1. Name two monosaccharides.
2. Which disaccharide is composed of two molecules of glucose?
3. Name two polysaccharides.

Lipids

1. Which elements are fatty acids composed of?
2. What's the difference between saturated fatty acids and unsaturated fatty acids?
3. What's the difference between triglycerides and phospholipids?

Enzymes 1

1. What is the function of enzymes?
2. What is activation energy?
3. What do digestive enzymes do?

Enzymes 2

1. Why are enzymes described as 'specific'?
2. Explain why a denatured enzyme will not function.
3. Describe the effect of pH on enzyme activity.

Eukaryotic and Prokaryotic Cells

1. Give an example of a prokaryotic cell.
2. Name four organelles that plant and animal cells both have.
3. What is the function of mitochondria?

Microscopes

1. Name three things visible with a light microscope in both animal and plant cells.
2. Which type of microscope must be used to show the detailed ultrastructure of a cell?
3. What is the image recorded by an electron microscope called?

Functions of the Nucleus, Mitochondria and Cell Wall

1. Which organelle acts as the control centre of the cell?
2. In which organelle does respiration occur?
3. Describe the membranes of the mitochondrion.
4. What is the word equation for aerobic respiration?
5. Name the molecule used to provide energy for the processes inside of the cell.

6. Name the molecule that is found in bundles in plant cell walls.

Cell Membranes

1. Name the two types of molecule that make up the cell membrane.
2. Give four ways substances can cross cell membranes.
3. What do you call the diffusion of water molecules through the cell membrane?
4. Give another term for the concentration of water molecules.
5. Name the two types of protein involved in facilitated diffusion.
6. Why does active transport require ATP?

DNA and Protein Synthesis

1. What is the name given to the double stranded structure of DNA?
2. How many different bases are there in DNA?
3. Give the names of the bases in DNA.
4. How do the strands of DNA stay together?
5. What is complementary base pairing?
6. What is a gene?
7. What determines the order of amino acids in a protein?

RNA and Protein Synthesis

1. Why does a copy of a gene need to be made for protein synthesis?
2. What does m in mRNA stand for?
3. In RNA, which base is complementary to adenine?
4. Give the mRNA sequence that would be complementary to the DNA sequence: ATTGCGCA

Mutations

1. How many bases code for one amino acid?
2. What are mutations?
3. What do mutagenic agents do?

Chromosomes

1. Where is DNA found in a eukaryotic cell?
2. How many homologous pairs of chromosomes do human cells have?
3. Are homologous pairs of chromosomes identical? Explain your answer.
4. What is a chromatid?
5. What is the name of the region where two identical chromatids are joined?

Cell Division - Mitosis

1. Give three uses of mitosis.
2. Why is DNA replicated before cell division can occur?
3. Do the homologous pairs separate in mitosis?
4. How many cells are produced when a cell divides by mitosis?

Cell Division - Meiosis

1. Are gametes haploid or diploid?
2. Where in the human body does meiosis occur?
3. How many cell divisions are there in meiosis?
4. How many cells are produced when a cell divides by meiosis?

Size and Surface Area to Volume Ratio

1. Which has the bigger surface area to volume ratio, a small organism or a large organism?
2. An animal has a surface area of 7.5 cm^2 and a volume of 1 cm^3. What is its surface area to volume ratio?
3. Which animal has the biggest surface area to volume ratio - animal A (9.8:1) or animal B (0.98:1)?
4. Give three materials that need to be exchanged across the membranes of organisms' cells.

Structure of the Thorax

1. Why have large mammals evolved complex blood systems and lungs?
2. In what part of the lungs does gas exchange take place?
3. Describe the shape of the cells that make up the walls of the alveoli and explain how their shape suits their function?
4. What type of cell are the alveoli walls made of?
5. a. Why does oxygen diffuse from inside the alveoli into the blood?
   b. Name another gas that can pass easily through the walls of the alveoli.

Breathing In and Breathing Out

1. Describe the relationship between volume and pressure in an enclosed space.
2. Does the volume of the thorax increase or decrease when you breathe out?
3. Which two sets of muscle contract when we breathe in?

Disease

1. What are pathogens?
2. Give an example of an infectious disease.
3. What is a risk factor?
4. List two diseases that smoking is a risk factor for.

Immunity

1. What do phagocytes detect?
2. What kind of white blood cells produce antibodies?
3. What is the role of the T-cells?
4. What do vaccines contain?

The Circulatory System

1. Name the organ that pumps blood around the body.

2. Name the four chambers of the heart.
3. Name the three main types of blood vessel.
4. In which type of blood vessel are substances exchanged between the blood and the cells?

The Heart

1. Does the right-hand side of the heart pump blood to the body or to the lungs?
2. What is the function of the heart valves?
3. Do heart valves require energy to open and close?
4. Where does the blood go after leaving the atria?
5. Why are the walls of the ventricles thicker than the walls of the atria?
6. The sino-atrial node is sometimes called the heart's natural pacemaker. What is its function?
7. Why does the heart muscle require a blood supply?
8. Name the blood vessels that supply the heart muscle with blood.

Blood vessels

1. What is the role of the arteries in the circulatory system?
2. Explain the importance of the elastic tissue in the walls of the arteries.
3. Describe how arterioles can control the amount of blood flowing to an organ.
4. Capillaries have very thin walls, which sometimes have gaps in them. Explain how these characteristics make capillaries suited to their job.
5. What structure do veins contain, that other blood vessels do not have?
6. Explain how leg muscles help to return blood to the heart.

Blood

1. Name the substance picked up by the blood in the lungs.
2. How many molecules of oxygen are bound to a haemoglobin molecule when it is fully saturated?
3. Which gas affects the oxygen binding properties of haemoglobin?
4. Under what circumstances does a tissue require the most oxygen?

Variation and Evolution

1. What is an allele?
2. What is an adaptation?
3. Briefly describe natural selection?

Classification

1. What does classification involve?
2. What is a species?
3. List four things newer classification systems use to group organisms.

Xylem and Phloem

1. In the symplast system, which part of the cell does water move through?
2. Why is the column of water in the xylem under tension?

3. What substances are transported in the phloem tissue?