

**King Edward VI School,
Southampton**

**Scheme of Work
for IGCSE Biology**

3.1 Living organisms and cells

Content detail	iGCSE Exam. Paper
<p>Living organisms share the following basic characteristics:</p> <ul style="list-style-type: none"> • they require nutrition • they respire • they excrete their waste • they respond to their surroundings • they move • they control their internal conditions • they reproduce • they grow and develop 	1 and 2
<p>Describe the levels of organisation within organisms: organelles, cells, tissues, organs and systems.</p> <p>Recognise cell structures, including the nucleus, cytoplasm, cell membrane, cell wall, chloroplast and vacuole.</p> <p>Describe the differences between plant and animal cells.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Organisms are classified into six main groups – plants, animals, fungi, bacteria, protoctists and viruses.</p> <p>Describe the features common to organisms in each group, and some examples, as follows:</p> <ul style="list-style-type: none"> • Plants. These are multicellular organisms; they contain chloroplasts and are able to carry out photosynthesis; they have cellulose cell walls; they store carbohydrates as starch or sucrose. Examples include flowering plants, such as cereals (e.g. maize) and herbaceous legumes (e.g. peas or beans) • Animals. These are multicellular organisms; they do not contain chloroplasts and are not able to carry out photosynthesis; they have no cell walls; they usually have nervous coordination and are able to move from one place to another; they often store carbohydrate as glycogen. Examples include mammals (e.g. humans) and insects (e.g. houseflies and mosquitoes) • Protoctista. These are microscopic single-celled organisms. Some, such as <i>amoeba</i>, that live in pond water, have features like an animal cell, while others, such as <i>chlorella</i>, have chloroplasts and are more like plants. A pathogenic example is <i>plasmodium</i>, responsible for causing malaria. <p>Details of life cycles and economic importance are not required.</p> <p><i>Features and examples of fungi, bacteria and viruses are included in Topic 5.1.</i></p>	1 and 2

3.2 Nutrition in humans

Content detail	iGCSE Exam. Paper
Understand that a balanced diet should include carbohydrate, protein, lipid, vitamins, minerals, water and dietary fibre.	2
Recall sources and describe functions of carbohydrate, protein, lipid (fats and oils), vitamins A, C and D, and the mineral ions calcium and iron.	1
Understand that energy requirements vary with activity levels, age and pregnancy.	2
Recall the chemical elements present in carbohydrates, proteins and lipids (fats and oils).	1
Describe the structure of carbohydrates, proteins and lipids as large molecules made up from smaller basic units: <ul style="list-style-type: none"> • starch and glycogen from simple sugars; • protein from amino acids; • lipid from fatty acids and glycerol. 	1
Practical tasks:	
Describe the tests for glucose and starch, <i>lipids and proteins</i> .	1
Recall how to carry out a simple experiment to determine the energy content in a food sample.	2
Recognise the structures of the human alimentary canal and outline the functions of the mouth, oesophagus, stomach, small intestine, large intestine and pancreas.	1
Understand the processes of ingestion, digestion, absorption, assimilation and egestion.	1
Explain how and why food is moved through the gut by peristalsis.	1
Understand the role of digestive enzymes including <ul style="list-style-type: none"> • the digestion of starch to glucose by amylase and maltase, • the digestion of proteins to amino acids by proteases and • the digestion of lipids to fatty acids and glycerol by lipases. 	1
(continued)	1

<p>Recall that bile is</p> <ul style="list-style-type: none"> • produced by the liver and • stored in the gall bladder. <p>Understand the role of bile in</p> <ul style="list-style-type: none"> • neutralising stomach acid and • emulsifying lipids. <p>Explain how the structure of a villus helps absorption of the products of digestion in the small intestine.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Understand the role of enzymes as biological catalysts in metabolic reactions.</p> <p>Understand how the functioning of enzymes can be affected by changes in temperature</p> <p>Understand how the functioning of enzymes can be affected by changes in pH.</p> <p><i>Practical task:</i></p> <p>Describe how to carry out simple controlled experiments to illustrate how enzyme activity can be affected by changes in temperature.</p>	<p>1</p> <p>1</p> <p>2</p> <p>1</p>

3.3 Respiration

Content detail	iGCSE Exam. Paper
Recall that the process of respiration releases energy in living organisms.	1
Describe the differences between aerobic and anaerobic respiration.	1
Recall the word equation and the balanced chemical symbol equation for aerobic respiration in living organisms.	1
Recall the word equation for anaerobic respiration in plants and in animals.	1
<p><i>Practical tasks:</i></p> <p>Describe simple controlled experiments to demonstrate the evolution of carbon dioxide and heat from respiring seeds or other suitable living organisms.</p>	2

3.4 Gas exchange in humans

Content detail	iGCSE Exam. Paper
Describe the structure of the thorax, including the ribs, intercostal muscles, diaphragm, trachea, bronchi, bronchioles, alveoli and pleural membranes.	1
Understand the role of the intercostal muscles and the diaphragm in ventilation.	1
Explain how alveoli are adapted for gas exchange by diffusion between air in the lungs and blood in capillaries.	1
Understand the role of diffusion in gas exchange.	1
Understand the biological consequences of smoking in relation to the lungs and the circulatory system.	1
<i>Practical task:</i>	
Describe a simple experiment to investigate the effect of exercise on breathing in humans.	1

3.5 Plant nutrition

Content detail	iGCSE Exam. Paper
Describe the process of photosynthesis and understand its importance in conversion of light energy to chemical energy.	1
Recall the word equation and the balanced chemical symbol equation for photosynthesis.	1
Understand how carbon dioxide concentration, light intensity and temperature affect the rate of photosynthesis.	1
Explain how the structure of the leaf is adapted for photosynthesis.	1
Recall that plants require mineral ions for growth and that magnesium ions are needed for chlorophyll and nitrate ions are needed for amino acids.	1
<p><i>Practical tasks:</i></p> <p>Describe simple controlled experiments to investigate photosynthesis, showing the evolution of oxygen from a water plant, the production of starch and the requirements of light, carbon dioxide and chlorophyll.</p>	1

3.6 Gas exchange in plants

Content detail	iGCSE Exam. Paper
Understand the role of diffusion in gas exchange.	1
Understand gas exchange (of carbon dioxide and oxygen) in relation to respiration and photosynthesis.	1
Understand that respiration continues during the day and night, but that the net exchange of carbon dioxide and oxygen depends on the intensity of light.	2
Explain how the structure of the leaf is adapted for gas exchange.	1
Describe the role of stomata in gas exchange.	1
Recall the origin of carbon dioxide and oxygen as waste products of metabolism and their loss from the stomata of a leaf.	1
<i>Practical tasks:</i>	
Describe simple controlled experiments to investigate the effect of light on net gas exchange from a leaf, using hydrogen-carbonate indicator.	2

3.7 Food production

Content detail	iGCSE Exam. Paper
<p>Describe how glasshouses and polythene tunnels can be used to increase the yield of certain crops.</p> <p>Understand the effects on crop yield of increased carbon dioxide and increased temperature in glasshouses.</p> <p>Understand the use of fertiliser to increase crop yield.</p> <p>Understand the reasons for pest control and the advantages and disadvantages of using pesticides and biological control with crop plants.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
<p>Explain the methods which are used to farm large numbers of fish to provide a source of protein, including</p> <ul style="list-style-type: none"> • maintenance of water quality, • control of intraspecific and interspecific predation, • control of disease, • removal of waste products, • quality and frequency of feeding • use of selective breeding. <p style="text-align: center;"><i>Selective breeding is studied further in Topic 5.5</i></p>	<p>1</p>

3.8 Ecology

Content detail	iGCSE Exam. Paper
<p>Understand the terms: population, community, habitat and ecosystem.</p> <p>Describe the use of quadrats as a technique for sampling the distribution of organisms in their habitats.</p> <p>Practical task: Recall the use of quadrats to estimate the population size of an organism in two different areas.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Recall the names given to different trophic levels to include:</p> <ul style="list-style-type: none"> • producers, • primary, secondary and tertiary consumers and • decomposers. <p>Understand the concepts of:</p> <ul style="list-style-type: none"> • food chains, • food webs, • pyramids of number, • pyramids of biomass and • pyramids of energy transfer. <p>Understand the transfer of substances and of energy along a food chain.</p> <p>Explain why only about 10% of energy is transferred from one trophic level to the next.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

4.1 Movement of substances into and out of cells

Content detail	iGCSE Exam. Paper
<p>Recall simple definitions of diffusion, osmosis and active transport.</p> <p><u>U</u>nderstand that movement of substances into and out of cells can be by diffusion, osmosis and active transport.</p> <p>Understand the factors that affect the rate of movement of substances into and out of cells to include the effects of surface area to volume ratio, temperature and concentration gradient.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Understand the importance in plants of turgid cells as a means of support.</p> <p><u>U</u>nderstand why simple, unicellular organisms can rely on diffusion for movement of substances in and out of the cell.</p> <p>Understand the need for a transport system in multicellular organisms.</p>	<p>2</p> <p>1</p> <p>1</p>
<p><i>Practical task:</i></p> <p>Describe simple experiments on diffusion and osmosis using living and non-living systems.</p>	<p>1</p>

4.2 Transport in plants

Content detail	iGCSE Exam. Paper
Describe the role of phloem in transporting sucrose and amino acids between the leaves and other parts of the plant.	2
Describe the role of the xylem in transporting water and mineral salts from the roots to other parts of the plant.	1
Explain how water is absorbed by root hair cells.	1
Recall that transpiration is the evaporation of water from the surface of a plant.	1
Explain how the rate of transpiration is affected by changes in humidity, wind speed, temperature and light intensity.	1
<p><i>Practical task:</i></p> <p>Describe experiments that investigate the role of environmental factors in determining the rate of transpiration from a leafy shoot.</p>	1

4.3 Transport in humans

Content detail	iGCSE Exam. Paper
<p>Recall the composition of the blood: red blood cells, white blood cells, platelets and plasma.</p> <p>Understand the role of plasma in the transport of carbon dioxide, digested food, urea, hormones and heat energy.</p> <p>Describe the adaptations of red blood cells for the transport of oxygen, including shape, structure and the presence of haemoglobin.</p> <p>Recall that platelets are involved in blood clotting, which prevents blood loss and the entry of microorganisms.</p> <p><i>White blood cells will be studied in Topic 5.1.</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p>
<p>Describe the structure of the heart and how it functions.</p> <p>Understand that the heart rate changes during exercise and under the influence of adrenaline.</p> <p>Describe the structure of arteries, veins and capillaries and understand their roles.</p> <p>Recall the general plan of the circulation system to include the blood vessels to and from the heart, the lungs, the liver and the kidneys.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
<p>Practical task:</p> <p><i>Describe a simple experiment to investigate the effect of exercise on heart rate in humans.</i></p>	

4.4 Nerves and eyes

Content detail	iGCSE Exam. Paper
<p><u>U</u>nderstand that organisms are able to respond to changes in their environment.</p> <p>Understand that a coordinated response requires a stimulus, a receptor and an effector.</p> <p>Describe how responses can be controlled by nervous or by hormonal communication and understand the differences between the two systems.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Recall that the central nervous system consists of the brain and spinal cord and is linked to sense organs by nerves.</p> <p>Understand that stimulation of receptors in the sense organs sends electrical impulses along nerves into and out of the central nervous system, resulting in rapid responses.</p> <p>Describe the structure and functioning of a simple reflex arc illustrated by the withdrawal of a finger from a hot object.</p> <p>Practical task:</p> <p><i>Describe a simple experiment to show how the sensitivity of the skin differs on finger-tips, back of hand, wrist and forearm.</i></p>	<p>1</p> <p>1</p> <p>1</p>
<p>Describe the structure and function of the eye as a receptor.</p> <p>Understand the function of the eye in focusing near and distant objects, and in responding to changes in light intensity.</p>	<p>1</p> <p>2</p>

4.5 Coordination and homeostasis in humans

Content detail	iGCSE Exam. Paper
<p>Understand that organisms are able to respond to changes in their environment. <i>(Topic 4.4)</i></p>	1
<p>Understand that a coordinated response requires a stimulus, a receptor and an effector. <i>(Topic 4.4)</i></p>	1
<p>Recall how responses can be controlled by nervous or by hormonal communication and understand the differences between the two systems. <i>(Topic 4.4)</i></p>	1
<p>Understand that homeostasis is the maintenance of a constant internal environment and that the control of body water content and body temperature are both examples of homeostasis.</p>	1
<p>Describe the role of the skin in temperature regulation, with reference to</p> <ul style="list-style-type: none"> • sweating, • vasoconstriction and • vasodilation. 	2
<p>Understand the sources, roles and effects of the following hormones:</p> <ul style="list-style-type: none"> • ADH, • adrenaline, • insulin, • testosterone, • progesterone and • oestrogen. 	1

4.6 Human excretion

Content detail	iGCSE Exam. Paper
<p>Recall that the lungs, kidneys and skin are organs of excretion.</p> <p>Understand how the kidney carries out its roles of excretion and of osmoregulation.</p> <p>Describe the structure of the urinary system, including the kidneys, ureters, bladder and urethra.</p>	<p>1</p> <p>1</p> <p>1</p>
<p>Describe the structure of a nephron, to include</p> <ul style="list-style-type: none"> • Bowman’s capsule and • glomerulus, • convoluted tubules, • loop of Henlé and • collecting duct. <p>Describe ultrafiltration in the Bowman’s capsule and the composition of the glomerular filtrate.</p> <p>Understand that water is reabsorbed into the blood from the collecting duct.</p> <p>Understand that selective reabsorption of glucose occurs at the proximal convoluted tubule.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
<p>Describe the role of ADH in regulating the water content of the blood.</p> <p>Recall that urine contains water, urea and salts.</p>	<p>1</p> <p>1</p>

4.7 Coordination and response in plants

Content detail	Exam. Paper
Understand that plants respond to stimuli.	1
Describe the geotropic responses of roots and stems.	1
Describe positive phototropism of stems.	1
<p><i>Practical tasks:</i></p> <p><i>Controlled experiments to demonstrate phototropic and geotropic plant growth responses.</i></p>	

4.8 Reproduction

Content detail	iGCSE Exam. Paper
<p>Describe the differences between sexual and asexual reproduction.</p> <p>Understand that fertilisation involves the fusion of a male and female gamete to produce a zygote that undergoes cell division and develops into an embryo.</p>	<p>1</p> <p>1</p>
<p>Describe the structures of an insect-pollinated and a wind-pollinated flower and explain how each is adapted for pollination.</p> <p>Understand that the growth of the pollen tube followed by fertilisation leads to seed and fruit formation.</p> <p>Recall the conditions needed for seed germination.</p> <p>Understand how germinating seeds utilise food reserves until the seedling can carry out photosynthesis.</p> <p>Understand that plants can reproduce asexually by natural methods (illustrated by runners) and by artificial methods (illustrated by cuttings).</p> <p>Practical task:</p> <p><i>A practical exercise to compare the floral structure in insect-pollinated and wind-pollinated flowers.</i></p>	<p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p>
<p>Recall the structure and function of the male and female reproductive systems.</p> <p>Understand the roles of oestrogen and progesterone in the menstrual cycle.</p> <p>Describe the role of the placenta in the nutrition of the developing embryo.</p> <p>Understand how the developing embryo is protected by amniotic fluid.</p> <p>Recall the roles of oestrogen and testosterone in the development of secondary sexual characteristics.</p>	<p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p>

4.9 Carbon, nitrogen and water cycles

Content detail	iGCSE Exam. Paper
<p>Describe the stages in the water cycle, including</p> <ul style="list-style-type: none"> • evaporation, • transpiration, • condensation and • precipitation. 	2
<p>Describe the stages in the carbon cycle, including</p> <ul style="list-style-type: none"> • respiration, • photosynthesis, • decomposition and • combustion. 	1
<p>Describe the stages in the nitrogen cycle, including the roles of</p> <ul style="list-style-type: none"> • nitrogen fixing bacteria, • decomposers, • nitrifying bacteria and • denitrifying bacteria <p>(Specific names of bacteria are not required)</p> <p><i>Bacteria will be studied further in Topic 5.1</i></p>	2

5.1 Microorganisms

Content detail	iGCSE Exam. Paper
<p>Organisms are classified into six main groups – plants, animals, fungi, bacteria, protoctists and viruses. (Topic 3.1)</p> <p>Describe the features common to organisms in each group, and some examples, as follows:</p> <p>Fungi: These are organisms that are not able to carry out photosynthesis; their body is usually organised into a mycelium made from thread like structures called hyphae, which contain many nuclei; some examples are single-celled; they have cell walls made of chitin; they feed by extracellular secretion of digestive enzymes on to food material and absorption of the organic products; this is known as saprotrophic nutrition; they may store carbohydrate as glycogen.</p> <p>Examples include <i>Mucor</i>, which has the typical fungal hyphal structure, and yeast which is single-celled.</p> <p>Bacteria: These are microscopic single-celled organisms; they have a cell wall, cell membrane, cytoplasm and plasmids; they lack a nucleus but contain a circular chromosome of DNA; some bacteria can carry out photosynthesis but most feed off other living or dead organisms.</p> <p>Examples include <i>Lactobacillus bulgaricus</i>, a rod-shaped bacterium used in the production of yoghurt from milk, and <i>Pneumococcus</i>, a spherical bacterium that acts as the pathogen causing pneumonia.</p> <p>Protoctists: These are microscopic single-celled organisms. Some, like <i>Amoeba</i>, that live in pond water, have features like an animal cell, while others, like <i>Chlorella</i>, have chloroplasts and are more like plants. A pathogenic example is <i>Plasmodium</i>, responsible for causing malaria. (Topic 3.1)</p> <p>Viruses: These are small particles, smaller than bacteria; they are parasitic and can reproduce only inside living cells; they infect every type of living organism. They have a wide variety of shapes and sizes; they have no cellular structure but have a protein coat and contain one type of nucleic acid, either DNA or RNA.</p> <p>Examples include the tobacco mosaic virus that causes discolouring of the leaves of tobacco plants by preventing the formation of chloroplasts, the influenza virus that causes 'flu' and the HIV virus that causes AIDS.</p> <p style="text-align: right;">(continued)</p>	<p>1 and 2</p>

<p>Understand the role of yeast in the production of beer.</p>	1
<p>Describe a simple experiment to investigate carbon dioxide production by yeast, in different conditions.</p>	1
<p>Understand the role of bacteria (<i>Lactobacillus</i>) in the production of yoghurt.</p>	2
<p>Interpret and label a diagram of an industrial fermenter and explain the need to provide suitable conditions in the fermenter, including aseptic precautions, nutrients, optimum temperature and pH, oxygenation and agitation, for the growth of microorganisms.</p>	1
<p>Practical task:</p>	
<p>Describe a simple experiment to investigate carbon dioxide production by yeast, in different conditions.</p>	1
<p>Recall the term 'pathogen' and know that pathogens may be fungi, bacteria, protoctists or viruses.</p>	1 and 2
<p>Describe how the immune system responds to disease using white blood cells, illustrated by phagocytes ingesting pathogens and lymphocytes releasing antibodies specific to the pathogen.</p>	1
<p>Understand that vaccination results in the manufacture of memory cells, which enables future antibody production to the pathogen to occur sooner, faster and in greater quantity.</p>	2

5.2 Inheritance

Content detail	iGCSE Exam. Paper
<p>Recall that the nucleus of a cell contains chromosomes on which genes are located.</p> <p>Understand that a gene is a section of a molecule of DNA.</p> <p>Describe a DNA molecule as two strands coiled to form a double helix, the strands being linked by a series of paired bases: adenine (A) with thymine (T), and cytosine (C) with guanine (G).</p> <p>Understand that genes exist in alternative forms called alleles which give rise to differences in inherited characteristics.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
<p>Recall the meaning of the terms:</p> <ul style="list-style-type: none"> • dominant, • recessive, • homozygous, • heterozygous, • phenotype, • genotype and • codominance. <p>Describe patterns of monohybrid inheritance using a genetic diagram.</p> <p>Understand how to interpret family pedigrees.</p> <p>Predict probabilities of outcomes from monohybrid crosses.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>
<p>Recall that the sex of a person is controlled by one pair of chromosomes, XX in a female and XY in a male.</p> <p>Describe the determination of the sex of offspring at fertilisation, using a genetic diagram.</p> <p>Understand that random fertilisation produces genetic variation of offspring.</p> <p>Recall that in human cells the diploid number of chromosomes is 46 and the haploid number is 23.</p> <p style="text-align: right;">(continued)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

<p>Understand that variation within a species can be</p> <ul style="list-style-type: none"> • genetic, • environmental, or • a combination of both. <p>Recall that mutation is a rare, random change in genetic material that can be inherited.</p> <p>Understand that many mutations are harmful but some are neutral and a few are beneficial.</p> <p>Understand that the incidence of mutations can be increased by exposure to ionizing radiation (for example gamma rays, X-rays and ultraviolet rays) and some chemical mutagens (for example chemicals in tobacco).</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p>
<p>Describe the process of evolution by means of natural selection.</p> <p>Understand how resistance to antibiotics can increase in bacterial populations.</p>	<p>1</p> <p>1</p>

5.3 Cell division

Content detail	iGCSE Exam. Paper
<p>Understand that division of a diploid cell by mitosis produces two cells which contain identical sets of chromosomes.</p>	1
<p>Understand that mitosis occurs during</p> <ul style="list-style-type: none"> • growth, • repair, • cloning and • asexual reproduction. 	1
<p>Understand that division of a cell by meiosis</p> <ul style="list-style-type: none"> • produces four cells, • each with half the number of chromosomes, and • this results in the formation of genetically different haploid gametes. 	1

5.4 Cloning

Content detail	iGCSE Exam. Paper
Describe the process of micropropagation (tissue culture) in which small pieces of plants (explants) are grown <i>in vitro</i> using nutrient media.	1
Understand how micropropagation can be used to produce commercial quantities of identical plants (clones) with desirable characteristics.	1
Describe the stages in the production of cloned mammals involving the introduction of a diploid nucleus from a mature cell into an enucleated egg cell, illustrated by Dolly the sheep.	1
Evaluate the potential for using cloned transgenic animals, for example to produce commercial quantities of human antibodies or organs for transplantation.	2

5.5 Selective breeding

Content detail	iGCSE Exam. Paper
Understand that plants with desired characteristics can be developed by selective breeding	1
Understand that animals with desired characteristics can be developed by selective breeding.	1

5.6 Genetic modification

Content detail	iGCSE Exam. Paper
<p>Describe the use of restriction enzymes to cut DNA at specific sites and ligase enzymes to join pieces of DNA together.</p>	1
<p>Describe how plasmids and viruses can act as vectors, which take up pieces of DNA, then insert this recombinant DNA into other cells.</p>	1
<p>Understand that large amounts of human insulin can be manufactured from genetically modified bacteria that are grown in a fermenter.</p>	1
<p>Evaluate the potential for using genetically modified plants to improve food production (illustrated by plants with improved resistance to pests).</p>	1
<p>Recall that the term 'transgenic' means the transfer of genetic material from one species to a different species.</p>	2

5.7 Human influences on the environment

Content detail	iGCSE Exam. Paper
<p>Understand the biological consequences of pollution of air by sulphur dioxide and by carbon monoxide.</p> <p>Recall that the following are all greenhouse gases:</p> <ul style="list-style-type: none"> • water vapour, • carbon dioxide, • nitrous oxide, • methane and • CFCs <p>Understand how human activities contribute to greenhouse gases.</p> <p>Understand how an increase in greenhouse gases results in an enhanced greenhouse effect and that this may lead to global warming and its consequences.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
<p>Understand the biological consequences of pollution of water by sewage including increases in the number of microorganisms causing depletion of oxygen.</p> <p>Understand that eutrophication can result from leached minerals from fertilizer.</p> <p>Understand the effects of deforestation, including</p> <ul style="list-style-type: none"> • leaching, • soil erosion, • disturbance of the water cycle and • disturbance of the balance in atmospheric oxygen and carbon dioxide. 	<p>2</p> <p>1</p> <p>1</p>